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ABSTRACT

This document describes the job opportunities forecast system which provides estimates of total job openings expected to be available in the Washington State Labor market annually through 1985. (The forecast has been keyed to occupational skills consistent with educational programs in the state. This edition of the forecast has been expanded to include professional occupations as well.) The methodology behind the forecasts is discussed in this document, but the actual projections are included in a companion document, CE 018 691. The main body of this document discusses the generalized framework of the Occupational Education Forecast System into which the Washington input fits. The information is divided into the following sections: (1) introduction to the Occupational Education Forecasting System; (2) description of the forecast system; (3) limitations of the forecast system; (4) procedures for assignment coding; and (5) methods of computation. Appended are tables/figures supporting the Occupational Education Forecasting System and tables supporting the adaptation of the Occupational Education Forecasting System to Washington State. (BM)

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Job Opportunities Forecast For Washington State 1974 to 1985

Washington State
Commission for Vocational Education

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TECHNICAL REPORT

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U S DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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The Interagency Forecast Task Force provided guidance and overall systems planning. Members of the Task Force contributed to the preparation of the system input. Raymond Harry, of the State Board for Community College Education and Task Force Chairman, coordinated the revision of the Crosswalk assignments. He was assisted in this effort by Peggy Anet and Neil Uhlman of the Council for Post Secondary Education, and the program development staff of the Office of the Superintendent of Public Instruction. Data for the Economic Forecast was taken from the *Long Term Employment Forecast*, prepared by David Weig, then of the Department of Revenue, now of the Office of Financial Management. The Industry-Occupation Matrix was made available by Brian Long of the Department of Employment Security. Robert Conner and David Bosse, also of Employment Security, coordinated the adaptation of the matrix and other labor force statistics for use in the Occupational Education Forecasting System.

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PREFACE: WASHINGTON STATE JOB OPPORTUNITIES FORECAST

The Commission for Vocational Education has a legislative mandate to manage statewide vocational education programs. This is also consistent with the intent of Public Law 90-576 and the Educational Amendments of 1976 (PL94-482). Both requirements place a priority and commitment on the need for comprehensive planning of vocational education programs statewide. The Job Opportunities Forecast provides estimates of total job openings expected to be available in the Washington State labor market, annually through 1985. The forecast is keyed to occupational skills consistent with educational programs in the state. The primary purpose was to provide a statewide vocational education program structure and data base. However, this year the forecast was expanded to include professional occupations as well. The first and second editions of this forecast have provided meaningful trends for developing guidelines to comprehensive planning of educational programs.

This third edition of the Washington State Job Opportunities Forecast (JOF) continues the development of the Occupational Education Forecasting System, the computer model that produces the JOF. Significant systems improvements were made to the internal structure of the model. Externally, the systems input was updated and in some cases revised completely. The resulting projections of job opportunities are not presented here, but are included in the *Summary of Findings*, a separate volume of this report. This volume discusses the methodology behind the forecasts.

Basicly, the Job Opportunities Forecast projects demand for Washington State employment in areas corresponding to educational programs. These

forecasts were produced on a generalized computer model, the Occupational Education Forecasting System, developed by the Human Resources Planning Institute. The generalized system utilized a set of Washington specific input data. A Washington State industry-occupation matrix was used, together with a set of specifically developed assignment codes, to produce staffing ratios applicable to Washington's educational programs. These staffing ratios represent the proportion of employment applicable to the skills corresponding to educational program. A separate set of ratios were developed for several economic categories representing pertinent Washington industry groupings. The model was driven by forecasts of employment in these economic categories through fiscal year 1985.

This year the primary data base of the model, the industry-occupation matrix, was converted from the manpower tallies of the 1970 census, to a more recent matrix produced by the Bureau of Labor Statistics (BLS) and its state representative, the Employment Security Department. While still based upon the original census data, the BLS/ES matrix represents a significant improvement in capturing the occupational structure of a dynamic labor market. Also provided by BLS were revised labor force separation rates that reflect the recent shifts in job commitment by female workers. These shifts make female replacement rates more closely aligned to male replacement rates in many occupations. Other revisions to the system input include a new edition of the Governor's economic forecast by the Department of Revenue, and a major reworking of the correspondence index (crosswalk between educational programs and matrix occupations) by the State Board for Community College Education. All of these items will be explained in detail within the report.

Major systems improvements internal to the model were made possible by the availiability of the BLS matrix and labor force separation rates for both a recent historical year as well as a projected year. Thus, trending of the occupational staffing patterns, not possible using the single point-in-time census matrix, was made possible. The model was also adapted to allow disaggregation of the economic forecast (supplied as input) to any desired detail, up to that of the matrix itself. However, this feature was not utilized in the current JOF production. Preliminary comparison of results using both aggregated and disaggregated economic forecasts brought about no significant differences in the forecast. The feature remains available for use if it is ever needed for some future application.

The main body of the report discusses the generalized framework of the Occupational Education Forecast System into which the Washington input fits. The specific input used for the Washington Job Opportunities Forecast is presented in Appendix B to the report. The occupational assignment codes were developed by the Commission for Vocational Education and the State Board for Community College Education. The economic category employment forecasts were developed by the Washington State Department of Revenue. The forecast results are presented in the *Summary of Findings*.

1. INTRODUCTION TO THE OCCUPATIONAL EDUCATION FORECASTING SYSTEM

The Occupational Education Forecasting System is a computer model of the employment demand for occupational skills related to educational programs. The resulting demand projections are estimates of total job openings and are not limited to just full time or entry level positions. However, in spite of this limitation, the forecasts represents one of the best available data sources upon which to base educational programing planning. In the past, application of this system has been solely for vocational educational programs. Thoughout this report that distinction will sometimes be made. However, the model requires no such distinction and is capable, if desired, to project demand for professional occupations as well.

The operation of the model is straightforward. Employment forecasts for a set of industry categories, called economic categories within this report, are supplied to the model for a given state or Standard Metropolitan Statistical Area (SMSA). The model translates the industry input for these economic categories into vocational employment by means of staffing patterns depicted in a detailed industry-occupation matrix for the same region. A sophisticated system of correspondence assignments, often referred to as the crosswalk, is utilized to convert the occupational categories of the matrix into occupational categories related to skills associated with educational programs. The educational programs are classified according to the system developed by the U. S. Office of Education. Within this report educational programs will often be referred to as OE-Programs. The resulting forecast combines estimates of both new openings and replacement demand for each OE-Program within a given geographic area.

This report describes the methods by which the system derives the forecasts. It contains a description of the generalized forecasting system (Section 2), a discussion of the limitations on the results imposed by design restraints and systems input (Section 3), a standardized procedure for determining the correspondence between matrix categories and the OE-Programs (Section 4), and a description of the computational methods employed by the model (Section 5). Tables, figures, a glossary and a bibliography supporting the discussion of the generalized forecasting system are included in Appendix A. A discussion of the application of the forecast system to a specific state or SMSA is included in the preface to this report. Tables supporting the application are given in Appendix B. The forecast results are included in a separate report.

2. DESCRIPTION OF THE FORECAST SYSTEM

The Occupational Education Forecasting System is based upon a large body of industry and occupation employment information produced by the Bureau of Labor Statistics (BLS). These data can be made available through the BLS representative at the state level, the Department of Employment Security. Similar matrices are available for each state and selected Standard Metropolitan Statistical Area (SMSA) within a state.* Similar matrices are available for several historical years as well as a projected matrix in a future year. The appropriate matrix must be selected to match the region for which forecasts are desired. The availability of matrices for several points in time allows the trending of the information they contain to capture shifts in the occupational structure of the labor force.

The sheer bulk of the data on the matrix tape requires that the forecast system be installed on a digital computer. Chapter 5 of this report describes, in detail, the various computer programs that carry out the computations needed to produce the forecast. The present discussion will describe the forecast system in general terms, referring to Figures A1 through A10 in Appendix A. Corresponding to the hypothetical examples of these figures are tables of actual input data for a specific geographic region. These specific tables are presented in Appendix B.

The forecasting system can be divided into two basic processed. First, the original matrix data is compressed into an employment matrix that corresponds to a given set of educational programs (OE-Programs) and a set of economic categories (ECC). The economic categories are selected to capture the industry groupings pertinent to the specific geographic region of the forecast and can be disaggregated to any level up to that of the matrix itself.

*These matrices are described in detail in Chapter 5: Methods of Computation.

The OE-Program titles can be divided into three sections. For example, let Section 1 contain current education programs, Section 2 contain potential education programs and Section 3 contain other occupations not included in Sections 1 or 2. This rather large residual category would contain all employment presently not specifically applicable to education programs. In the second basic process, a set of staffing ratios are computed from the compressed employment matrix. These ratios represent the proportion of economic category employment devoted to each of the OE-Programs. The staffing ratios are trended with time and then applied to an allocation of the employment forecasts for the economic categories. This inturn leads to estimates of job opportunities applicable to each of the OE-Programs. Each of these two processes will now be discussed.

The Squeeze Process

The first process starts with the detailed industry-occupation data of the matrix for a given year. Figure A1 describes the basic structure of the matrix data: employment in 377 occupational and 184 industry categories; 70 thousand data elements in all.* Tables A1 and A2 list the industry and occupation categories of the matrix. The detailed data is aggregated, according to a sophisticated system of correspondence codes, into a matrix of employment for a given set of OE-Programs and another set of economic categories. Both the O-E Programs and the economic categories are pertinent to the given geographic area of the matrix data.

*The original BLS version of the matrix includes slightly more industry detail (201 categories), as well as a breakout of 7 worker classes for each cell. However, the "rolled-up" version produced by Employment Security (referred to above) does not include this additional detail.

Figure A2 describes the aggregation as a two-step "squeeze" process. First, the 377 matrix occupations are compressed to match the OE-Programs. Second, the 184 matrix industries are compressed to match the economic categories. At the heart of the squeeze process are the correspondence or assignment codes usually referred to as the "crosswalk". A major activity of preparing the input to the forecasting system is the preparation of a crosswalk specifically tailored to the geographic area of the forecast. The procedures for generating the crosswalk are presented in Section 4. The mechanism behind the crosswalk is shown pictorily in Figure A3 through A7 for the matrix-to-OE squeeze and on Figure A8 for the industry-ECC squeeze. The resulting crosswalk for the current forecast is given in Tables B1 and B3. The end result of the squeeze process is a new matrix, much smaller than the original, hand tailored to fit the OE-Programs and economic categories pertinent to the region of the forecast.

By applying the squeeze process to two matrices, one of the latest historical employment data and the other of projected employment in some future year, a pair of OE-ECC matrices can be prepared. The availability of employment data for two points in time gives the system the information needed to depict shifts in the occupational structure of a dynamic labor force.

Demand Forecasts

The second basic process of the forecasting system starts with each employment value in an OE-ECC matrix being used to compute a corresponding staffing ratio. The staffing ratios represent the proportion of employment in a given economic category that is applicable to a given OE-Program (or to the residual "Other Occupations" category). Thus, for example, the proportion of welders in the durable goods economic category is represented by a single staffing ratio.

Other staffing ratios are computed for the other OE-Programs from the remaining employment in durable goods. The denominator for each ratio in this set is the total employment in durable goods. Many OE-Programs will have no matrix employment applicable to the durable goods economic category. The staffing ratios for these programs will be zero. The sum of all ratios for the durable good category must, by necessity, have a value of one. A separate set of staffing ratios are computed for each economic category. A table of staffing ratios for a sample OE-Program is presented in Table B7.

Using the above procedure, staffing ratios are computed for two points in time. The ratios are then trended over the interviewing years to match the year of the economic forecast.

The staffing ratios trended for a given year multiply corresponding values of region-wide employment forecasts in the economic categories. The result is a set of employment forecasts by economic category applicable to each OE-Program (and the "other occupations" category). The set of values for a given OE-Program is in turn aggregated to give total employment appliable to the occupational skills of that program in a given year. This process is repeated using the trended staffing ratios applied to the economic category forecasts for six additional years. The above procedure can be thought of as an allocation of the economic forecast, where the staffing ratios represent the allocation coefficients. Figure A9 describes this procedure. Employment forecasts values for the specific set of economic categories used in the current JOF are presented at the end of Appendix B.

A change in employment level is determined for each of six years by taking annual differences between the seven-year employment forecasts for each OE-

Program. This change is termed expansion and represents new jobs created by economic growth. A "negative" expansion indicates a decline in employment levels from one year to the next.

An estimate of vacancies created by persons leaving their jobs due to death, retirement, out-migration, promotion, quits, discharges and other labor separation reasons is now computed. The number of these vacancies that are filled each year is estimated through the use of a replacement rate; the proportion of employment applicable to a given OE-Program that will be replaced each year. Replacement rates are available for each of the matrix occupations from the Bureau of Labor Statistics.* A separate set of rates is available for each state for a historical and a projected year. The replacement rates for the 377 occupational categories of the matrix used for the current forecast are presented in Table B5. During the squeeze process that compresses the 377 matrix occupations, an employment-weighted average replacement rate is computed for each OE-Program (and for the "other occupations" category). During the demand calculations, the averaged replacement rates for each of the two OE-ECC matrices are trended linearly to determine a rate applicable to a given OE-Program in a given year. These rates when multiplied by the OE-employment for the same year give the replacement needs for that program.

Total demand, or job opportunities presented by anticipated employment, is now computed by summing the expansion and replacement forecasts in each

*The BLS replacement rates do not capture occupational shifts within the labor force. This significant but relatively unexplored aspect of the labor market is discussed in the article: Occupational Mobility in the American Labor Force by Dixie Summers and Alan Eck, Monthly Labor Review, January 1977.

sector for each OE-Program. An example of how expansion, replacement and demand are computed is given in Figure A12. A forecast output table for a sample OE-Program is presented in Table B8. The full set of OE-Program staffing ratios, OE-replacement rates and demand forecast tables are presented in a separate report.

It should be noted that the resulting projections of employment demand represents total job openings. This is a consequence of the methodology of the model, which inturn is restricted by the methodology of the data base. Thus, the entry level positions, of most interest to graduates of educational programs, are an inseparable component of the total demand. Even with this restriction, the information provided by the model is a valuable tool for the program planner, as well as the student, since it places an upper bound on the job openings.

3. LIMITATIONS OF THE FORECAST SYSTEM

In developing a forecast system of any complexity numerous assumptions and design decisions must be made. The mathematical model which generates the forecast is, by definition, an approximation of a real economic system. Thus, in order to better appreciate the values displayed on the forecast tables, a few words are desirable to explain some of the major assumptions, and the limitations they impose on the forecast results.

The results of the Job Opportunities Forecast have some limitations in their application to educational program planning. First, the projections of employment demand represent total job opportunities. They are not restricted to just entry level positions. Also, they represent a count of jobs rather than a count of workers. Thus full-time, part-time and multibly held ("moonlighting") jobs are counted in the total. This is a consequence of the model methodology which in turn is a consequence of the methods of deriving in input data. However, total job openings represent an upper bound on the positions available to graduates of educational programs and is still a useful program planning tool.

A second characteristic of the results concerns the estimates of job openings due to replacement needs. This component of the total demand is computed from labor force separation rates supplied by BLS. These rates do not reflect replacement due to occupational mobility, but are restricted to workers separating from the labor force. Thus, a worker changing his occupation but remaining in the labor force does not create a replacement job opening. The effects of occupational mobility are relatively unexplored and have not been accounted for by this model. Sommers and Eck report in their recent article Occupational Mobility and the American Labor Force* that between 1965 and 1970 changing

*Monthly Labor Review, January 1977.

occupations was twice as common as leaving the labor force. It should be kept in mind, however, that workers shift both into and out of a given occupation. Therefore, even though the total changes of occupations may be quite significant, the net change to any given occupation may well be small.

The methodology used by the model has been refined and improved with each successive edition of the Job Opportunities Forecast. The most recent modifications added the capability of trending staffing ratios and replacement rates with time in order to better reflect the shifts in the occupational structure of the real labor force. Also, the capability of utilizing a highly disaggregated set of economic categories was added. Thus, most of the remaining limitations of the model are external, imposed by the characteristics of the various input data that drive the forecast system.

The model is designed around the BLS industry occupation matrix, which in-turn is based upon the manpower tallies of the 1970 census. This is not the place to review the census's methodology, but it should be pointed out that the manpower tallies of industry-occupation employment are based on a sample and, therefore, can be expected to contain small random errors. Also, the classification of each respondent to the census survey into a particular industry-occupation cell is not perfectly certain. Not only is the judgement of the census tabulator involved, but the industry designation of a particular firm may change abruptly. There is a natural tendency of respondents to upgrade themselves when specifying their occupational category. Thus, people who work as typists might classify themselves as secretaries. Similarly, individuals may possess more than one skill: they may work mostly in occupation A, but also in occupation B. The census only records the principal occupation of each person and the industry into which most of a firm's products fall. These discrepancies in the classification system become apparent when

reviewing the tabulation of the census occupations. Some categories forecast no workers; an example of this is political scientists. This is because people in this category were classified elsewhere in the 1970 census tabulation.

The consequence of all of this is that in a few cases the employment reported by the census differs significantly from other available surveys and labor employment reports. These problem areas should be identified and tagged for additional review. Perhaps, as a future modification, staffing ratios can be generated from sources other than the census and entered into the model to update the problem census data. In any case, even though census limitations are sometimes perplexing, it should be kept in mind that they represent only a tiny minority of the huge body of data that the census provides and in many cases have been corrected in the BLS matrix.

In utilizing the census data base to generate their industry-occupation employment matrices, BLS has taken steps to correct many of the limitations of the manpower tallies. Thus, the Occupational Education Forecasting System in shifting from the original census data to using the BLS matrix takes advantage of these improvements. The special "rolled-up" version of the BLS matrix prepared by the Department of Employment Security is discussed along with other input data in Section 5.

Another type of system limitation centers on how the model adapts the matrix input in making OE-Program forecasts. The various assignment code decks are at the heart of this process. It is up to the user of the model to generate an appropriate set of correspondences between the matrix categories and the set of OE-Programs for which forecasts are needed. The degree to which the forecasts capture actual employment applicable to the OE-Programs is deter-

mined to a great extent by the amount of skill that is brought to bear on the generation of the assignment codes. It should be kept in mind that no matter how sophisticated the internal algorithms of the system are in producing a forecast, if the assignment codes are not appropriate then the forecasts will be unsatisfactory.

Details of assignment coding procedures are discussed in Section 4. However, a few words in this section on how coding problems impose limitations on the acceptability of the forecasts will be useful. An example of the type of problem that the person determining the assignment codes must face centers around the use of shared or coefficient assignments. In some cases several OE-Programs seem to apply to the same set of matrix occupational and industry categories. In these cases the employment from the set of matrix categories is shared among the several OE-Programs according to a set of coefficients. But what values should be specified for each coefficient? In lieu of any "hard" data from which to derive coefficients the code preparer is forced to estimate values. Often these estimates result in equal shares to each of the several OE-Programs. While the estimation of coefficient assignments in this manner is often the best available coding method, it is not always clear that these "ad hoc" coefficients will produce acceptable forecasts. Thus, special attention should be paid in the review of forecast values produced with this type of coefficient. The decision of whether or not to make use of the shared assignment feature may in part be based upon the degree of expertise available to estimate the needed coefficients.

It is clear that the code preparer needs more information upon which to base the decisions and assumptions that are part of the code generation process. The Bureau of Labor Statistics has published a table of conversions from the occupational titles in the BLS national matrix to the Vocational Education

(OE) Classification system in Supplement 3 to Tommorrow's Manpower Needs. The Office of Education (HEW) and the Manpower Administration (DOL) have published an index of vocational OE-Programs and their correspondence to occupational categories in the Dictionary of Occupational Titles (see bibliography in Appendix A). Also, the crosswalks developed in other states, particularly California and Oregon, are often useful references. The report containing the California Crosswalk is listed in the Bibliography at the end of Appendix A. Although these references are of great assistance in preparing assignment codes for many OE-Programs, the detail is often not fine enough to satisfy all assignment problems. These references do not always reflect the local mix of industry and occupational employment or the local mix of educational programs. What is needed, but usually not available, is a survey of the local designers of each OE-Program to determine in which industry and occupational areas graduates of their courses are most likely to be employed. Also, follow-up surveys are needed to determine in which occupations and industries graduates were actually employed.

Even with all of the aids discussed above, the preparation of a set of assignment codes for a specific region is an exacting and tedious process. All of the available information must be patiently correlated. The resulting assignment codes are a product of a good deal of careful judgement. To minimize inconsistencies in the code preparation, a standardized technique must be adopted. This technique is discussed in Section 4.

In concluding this chapter on system limitations some brief mention should be made on the forecasts for the economic categories which are supplied as input to the demand forecast. Systems modifications have been made to allow disaggregation of the economic forecast to any level of detail up to that of

the 184 matrix industries categories. It was hoped that a disaggregated economic forecast would add sensitivity to the model. However, preliminary comparison of JOF results using first an aggregate, then a disaggregated economic forecast, showed only trivial differences. It is, therefore, questionable whether a highly disaggregated economic forecast provides benefits to the results commensurate with the effort needed to prepare them. The feature remains in the system, however, and if desired it can be used.

Another aspect of the economic forecasts is that they must be realistic. The values specified for these categories are usually coordinated with statewide employment forecasts and, therefore, very little leeway is permitted in making revisions to the forecast values. The total employment reported for all educational programs (and the other occupations category) match the total employment supplied in the economic forecast. Thus, if the economic category forecasts fail to capture realistic trends in state employment, so do the educational forecasts of this system.

4. PROCEDURES FOR ASSIGNMENT CODING

The forecasting system predicts the demand for occupational skills corresponding to educational programs. This is accomplished by deriving a set of staffing ratios for the educational programs from employment reported on the ES/BLS industry-occupation matrix. Therefore, a correspondence must be established between matrix occupational employment categories and educational programs. This correspondence is specified by the system user in the form of a set of assignment codes, usually referred to as the "crosswalk", which direct the computer in selecting occupations (both as a whole, or restricted to specific industries) to match with appropriate educational programs. This chapter describes the method of generating the crosswalk assignments.

A second coding problem dealt with below is that of matching census industry categories to the categories of the economic forecast (ECC) provided, as input to the system. Conceptually this problem is far simpler than matching the educational programs to matrix occupations, and it is dealt with as part of the larger consideration of aggregating industry categories.

Fundamentals

Data on occupational employment is available from the ES/BLS industry-occupational matrix which inturn is based upon the manpower tallies of the 1970 census. The structure and technical characteristics of the matrix is discussed in Section 2 and in Section 5. For purposes of discussion, here the matrix can be pictured as a giant grid: along one side are 377 occupations and across the top are 184 industries.

If an occupation is summed over 184 industries, the result is total employment in the selected occupation. By summing over all occupations for

a given industry, total industry employment is found. The whole matrix contains almost 70,000 cells, each cell representing the level of employment of one occupation in one industry. If this matrix were put on a wall chart and each cell were ½ inch by ½ inch, it would cover an area 7½ by 15½ feet.

In generating assignment codes the user's problem is to determine how to establish a unique correspondence between each matrix cell or blocks of matrix cells and the relevant educational programs. The degree of detail used in generating assignment codes, i.e., whether each matrix cell is treated separately or whether they are taken in blocks, will depend upon the user's time, cost, and information constraints.

At the most basic level each occupation may be taken as a single block containing employment in all industries. Their correspondences will be established between total employment in each occupation and the relevant educational programs. An example of this type of assignment is depicted in Figures A4 and A5. This is entirely adequate for systems offering a limited number of fairly general programs. However, in larger educational systems, especially vocational education systems, certain programs are not only occupation specific but also industry specific. Then it may be desirable to make more detailed assignments at the industry level. An example of this type of assignment is depicted in Figures A6 and A7. At the extreme limit all 70,000 cells could be individually inspected and assigned, but such detailed assignment would exceed the precision of our information about the demand for occupational skills by many times. Even at a gross level of detail, the task of matching educational programs to the industry-occupation matrix is large and complex. Since errors in coding will tend to propogate throughout the system, it is imperative that a

systematic and an unambiguous coding technique be adopted. And in order that the results be both logical and complete, two fundamental principles must be observed. These are:

1) The purpose of the assignment codes is to tell the computer which occupation or industry-occupation group is responsible for the employment of persons posessing skills corresponding to a given educational program. Therefore, the assignments are logically from the programs to those occupations and industries for which that program is most relevant.
2) The system will permit one and only one assignment to be made to each matrix cell or block of cells, unless a provision is specifically introduced for making allocations (shares) among several vocational programs (see Figure A8). If allocations are made, the sum of the allocations should not exceed 100 percent of the cell or block of cells assigned unless a scaling of the matrix data is intended.

Coding Methods

There are five steps in the preparation of assignment codes. Each step is autonomous but they must be executed sequentially. Only the first, second and last steps are mandatory. The intervening steps, if followed, will provide more detailed correspondences. The five steps are:

1) Matching educational programs to occupations
2) Aggregation of industries and specification of Economic Categories (ECC's)
3) Industry assignments
4) Coefficient allocation
5) Preparation of computer input

Each step is described below.

Step 1: Matching educational programs to occupations.

Purpose: Establish correspondence between matrix defined occupations and educational programs. At this stage occupations are treated as a whole without regard to industry break down.

Method: Each matrix occupation is considered inturn and independently. Those programs which provide training relevant to that occupation are listed. If no relevant program exists the occupation may be flagged as an area for future program development or it may be discarded as 'not applicable.'

After an initial round of matching, the correspondences are reviewed. As much information as possible on the employment and qualifications of previous graduates from each program should be utilized. If no industry assignment or coefficient allocations are to be made (i.e., Steps 3 and 4 are to be skipped) then the correspondences must be checked to make sure there is one and only one match made with each census occupation.

Result: A list of 377 census occupations followed by the vocational programs which have been matched with each. For this purpose a 'future program' or a 'not applicable' notation counts as a match.

Comments: Precise equivalences do not exist between the matrix occupations and the educational programs defined by the OE codes. Although the Bureau of Labor Statistics has published a preliminary comparison of the matrix and OE classification systems, this provides only rough guidance. Lacking better data, placement records may be the most useful guide. For the matrix coding system, see 1970 Census

of Population: Classified Index of Industries and Occupation. For details on the OE system and correspondences with the Dictionary of Occupational Titles see: Vocational Education and Occupations.

Step 2: Industry aggregation and specification of economic categories.

Purpose: Aggregate matrix industries into the grossest level of detail consistent with any specific industry assignments to be made under Step 3 (as appropriate) and with definitions of Economic Categories (ECC's) used for input to the system.

Method: The matrix industries are explicitly defined in terms of the 1972 Standard Industrial Classification, as are the ECC's. Aggregations are noted by listing each ECC followed by the constituent matrix industry code numbers (see Figures A9 and A10).

For use in making industry assignments of vocational programs to matrix occupations a more detailed industry list than the ECC's may be desirable. The appropriate aggregation will vary according to the educational programs offered and the predominant industries in the region. However, coding of industry assignments will be simplified if the industry detail is reduced to less than 60 categories.

Results: 1) A table showing Economic Categories and constituent census industries listed by sequential code number. 2) If industry assignments are to be made, a second table showing industry assignment groups and constituent matrix industries.

Comments: Care should be taken to avoid deleting or double counting industries during aggregation process.

The aggregation of matrix industries into Economic Categories is shown in Tables B3. An example of a proposed industry detail for industry assignment coding is shown in Table A3. The first column of Table A3 lists the sequential code number for the industry categories from the matrix, for each aggregated category. The second gives the approximate SIC code for each redefined industry.

For detail of the SIC coding system, see the 1972 Standard Industrial Classification Manual. The 1970 Census of Population, Classified Index of Industries and Occupations gives equivalences between census and SIC codes. This later reference is useful because the industries and occupations of the BLS matrix have been adapted from the census categories.

Step 3: Industry assignments

Purpose: Restrict matching of educational programs to matrix occupations by specifying relevant industries.

Method: Each educational program to matrix occupation match is reviewed to determine which industry groups from among all those covered by the occupation are likely to employ persons trained by a given program.

Where no industry specificity exists, all industries are specified. Where two or more programs are matched with a single occupation, their industry assignments must be either homogenous, in which case allocation coefficients will be used to allocate share to each, or complementary.

Homogenous assignments are exactly parallel, industry for industry.

This would occur in cases where two programs offer virtually identical training in the same labor market. Complementary assignments are assignments such that no industry assignment is shared by another program. If necessary, programs having both homogenous and complementary assignments may be coded twice, first listing their homogenous or shared industry component and then their complementary assignments.

Results: A 'string' of industry assignments for each program listed under a matrix occupation. The 'strings' for each program are either homogenous (i.e., identical) or complementary (i.e., non-overlapping). Homogenous assignments will require allocation coeffients (see Step 4).

Comments: The industry assignments should be performed on a worksheet which lists all the industry aggregations defined in Step 3 along one dimension and all the programs matched with a given occupation in Step 1 along the other. Thus, there will be one worksheet per matrix occupation. Using such a worksheet will reveal at one glance when two programs share an industry assignment and when they have complementary assignments. An example of such a worksheet is shown as Table A4 in Appendix A.

In general, unnecessarily detailed industry assignments should be avoided, particularly when a good correspondence exists between an educational program and a matrix occupation. An example of a close fit might be "Practical Nursing." Since all practical nurses have similar qualifications, their industry attachment should make little difference. But where the occupation described is rather broad, such as 'Managers and Administrators', it may be desirable to specify in-

dustry detail. Thus, a supermarket management program might be matched only with managers employed in retail food stores.

Step 4: Coefficient allocation

Purpose: If multiple programs are listed for a given occupation or for a block of industries within one occupation, the several programs must be assigned coefficients adding up to one which allocate a share of the occupation to each.

Method: Shares should be allocated on the proportion of demand being fulfilled by each program. Unfulfilled demand may be allocated to a future program or to the 'not applicable' section.

Results: A set of allocation coefficients, one for each program sharing an identical 'string' of industry assignments for a given matrix occupation. The coefficients should total to 1.0 unless a scaling of the matrix data is intended.

Comments: Placement records provide the best guidance for making allocations. In general, the use of allocation coefficients will be most appropriate for programs offering similar training and meeting similar demand. Note that the sample industry assignment worksheet in Table A4 of Appendix A has a space for designating the allocation coefficient.

Step 5: Preparation of computer input

Purpose: Render data on industry-occupation into codes having a format acceptable to the computer which will perform the manipulations of the matrix specified by the assignment codes.

Method: The assignment codes are given in terms of educational program number and the sequential matrix code of each occupation and industry assignment.

Result: Coding sheets ready for keypunching.

Comments: Coding requirements may vary from program to program and should be carefully followed to insure compatibility. See the description of the census-to-OE assignment code deck given in Section 5 for details of coding formats. Also, see Table B1 in Appendix B for a listing of the OE codes-to-matrix assignment index used for the current forecast.

Concluding Remarks

The process of generating assignment codes requires skill and patience. Once a set of codes are developed they should not be considered static or final. Codes should be consistently updated and refined as additional information becomes available.

5. METHODS OF COMPUTATION

The detail of the industry-occupation matrix and the sophistication of the assignment crosswalk require the use of a digital computer. A system of computer programs was written to carry out the compulations of the model and to produce the various worksheets and tables displaying the forecast results. This system of programs, the data it requires for input, and the output tables it produces are discussed in this chapter. Figures A11-A12 show the interaction of the various components of the forecasting system. There is a short description of each data source and each program. The descriptions are not intended to serve as documentation for operation of the programs, but rather to act as a guide in understanding the computational methods of the system in producing the final forecast tables. Mathematical formulations of the computational procedures are specified where applicable.

The programs are installed on the Control Data Corporation (CDC) 6400 Computer at the University of Washington. All the programs are written in the FORTRAN computer language and thus, in theory, are adaptable for use on other large machines. However, in practice, FORTRAN compilers generally have minor deviations from the so-called standard FORTRAN. Thus, as an initial step in attempting to adapt the system for use on another computer, each program will have to be screened for deviations to the local version of FORTRAN. It is quite likely that program modifications would be required before the system could be made operational on another computer.

Data: Industry/Occupation Matrix - ES/BLS

Medium: Magnetic Tape

Use: Input into Program CONVERT

Description:

The ES/BLS Industry-Occupation Matrix is a matrix of occupational employment data produced by the Washington State Department of Employment Security. The source of the matrix data is from a similar matrix produced by the Bureau of Labor Statistics.* The ES version of the matrix is slightly more aggregated than the BLS version due to regulations prohibiting the disclosure of certain types of detailed employment records. Several of the industry categories have been combined and only the total of the worker class detail (government, self employment and unpaid family workers) is given. The occupational information is unchanged. The matrix was produced for three years: 1970, 1974, and 1985 (projections). For each year, employment is reported for 425 occupations (of which 377 are detailed and 48 are summary) and 241 industries (of which 184 are detailed and 57 summary).

Documentation Summary:

The tape is 9 track 800 BPI in BCD code. There are 482 records on the tape, 2 records for each industry. The matrix for each year is on similar, but separate tapes. The layout for each pair of records is shown on the following page. The titles of the industries and occupations included in the matrix are given in Table A2 and A3 respectively.

*An excellent description of the BLS industry-occupation matrix is available in the publication: Meeting State and Area Occupational Information Needs: The Industry-Occupation Matrix System, Massachusetts Division of Employment Security, July 1976.

INDUSTRY-OCCUPATION MATRIX, LAYOUT OF DATA FOR ONE INDUSTRY

Record 1 Layout

Record Position	No. of Characters	Data Description
1-4	4	Filler (zeroes)
5-6	2	Year
7-10	4	Area
11-16	6	Industry code
17	1	Record sequence number 1
18	1	Industry-level indicator
19	1	Class-of-worker code
20-22	3	Relative industry code
23-28	6	Filler (zeroes)
29-3518	3490	349 ten-position data entries

Record 2 Layout

Record Position	No. of Characters	Data Description
1-4	4	Filler (zeroes)
5-6	2	Year
7-10	4	Area
11-16	6	Industry code
17	1	Record sequence number 2
18	1	Industry-level indicator
19	1	Class-of-worker code
20-22	3	Relative industry code
23-28	6	Filler (zeroes)
29-1238	760	76 ten-position data entries
1240-3518	2730	Filler (blanks)

Data: Industry/Occupation Employment Matrix - HRPI

Medium: Magnetic Tape

Use: Output of Program CONVERT
Input to Program SQUEEZE

Description:

The data on this tape is the same as the Industry/Occupation Employment Matrix - ES/BLS, except that it is in unformatted binary integers rather than in BCD code and that it includes only the detailed level employment (377 occupations and 184 industries).

The binary matrix data can be read by Program SQUEEZE at a much faster rate than the BCD data. Since the matrix data must be read each time revisions are made to the crosswalk assignment codes, binary conversion of the data results in a substantial savings in computer operation costs. The matrix was created using buffer out write statements onto a 7 track 800 BPI tape. There are 387 words per record, one record for each of the 184 industries. Within each record are ten words of header information (see list below) and 377 words of occupational employment (binary integers). The titles for the industries and occupations included in the matrix are given in Table A2 and A3 respectively. The header information is as follows:

1. Year
2. Area Code
3. Industry Code
4. Record sequence number
5. Industry level indicator
6. Class of worker code
7. Relative industry code
8. Blank
9. Total employment for industry
10. Blank

Data: OE-Names (Program Titles)

Medium: Card Deck

Use: Input into Program MATRIX

Description:

The OE-Name deck is read by the program MATRIX and passed through its output file to Programs SQUEEZE and DEMAND.

Each card in the OE-Name deck has a title (up to 40 characters in length) and a corresponding OE-code (up to 9 characters in length). There is also a flag code on each card to identify the type of name that is specified. Choices for name type are:

- R — Regular title for a detailed-level OE-Program which has matrix ties specified in the census-to-OE code deck.
- D — Data-not-available (DNA) title for detailed-level OE-Program which does not have matrix ties specified in the matrix-to-OE code deck.
- F — Field title.
- nS — Summary (or cluster) title for the next n regular and DNA programs.
- C — Comment card that applies to preceding R or D title. Up to five comment cards may be included for any one R or D program title.

The OE-codes for all titles must be unique and in ascending order. The section 2 codes should end with "X". A listing of the OE-Name deck is given in Table B1.

Data: Matrix-to-OE Assignment Codes (Crosswalk)

Medium: Card Deck

Use: Input into Program MATRIX

Description:

The matrix-to-OE code deck describes the correspondence between each regular OE-Program in the OE-Name deck and the 377 occupational categories of the matrix. The codes in this deck are in a "shorthand" form that will later be expanded by Program MATRIX into a comprehensive set of 377 x 184 correspondence codes. Within the "shorthand" deck the occupational categories may be restricted to selected census industry categories or allowed to apply to all 184 matrix industries. The correspondence between the 184 matrix industry categories to a set of economic categories is included in a separate deck. The matrix categories are identified by the 3-digit sequential codes given in Tables A2 and A3 in Appendix A to this report.

Each assignment card presents the matrix industries applicable to a given occupation for one OE-Program. Occupations must be one to a card in ascending order. The codes within an industry string may be for individual categories (e.g. 001, 003, 005) or for blocks of categories (e.g. 010-020, 050-100). Also, the codes within each string should be in ascending order with no two codes duplicated. Continuation cards may be used to contain the codes of the industry string for a given OE-Program that won't fit on one card.

Individual cells or blocks of cells from the employment matrix may be shared between several OE-Programs by specifying a set of coefficients on the appropriate cards in the census-to-OE code deck. A coefficient on a given OE-code card applies to all matrix cells implied by the string of industries given on that card and its continuation cards. If the matrix-to-OE coding directs

the assignment of the same census matrix cell to more than one OE-Program without a coefficient being specified, only the final instruction is followed.

Data: ECC-Names

Medium: Card Deck

Use: Input to Program SQUEEZE

Description:

The ECC-name deck lists the titles of up to 184 economic categories for which staffing ratios will be computed by Program SQUEEZE. Each 40-character title has a corresponding 6-character abbreviation and a 4-digit ECC-code. A list of the ECC-Names used in the current forecast are given in Table B2.

Data: Matrix-to-ECC Assignment Codes

Medium: Card Deck

Use: Input into Program SQUEEZE

Description:

The matrix-to-ECC assignment code deck identifies the correspondence between the industry categories of the matrix tape and the categories of the economic forecast. A separate card is supplied for each economic category giving the ECC code, the ECC abbreviated name (matching the one given on the ECC name deck) and a string of 3-digit "sequential" matrix industry codes. As in the matrix-to-OE code deck, this string is composed of both individual matrix codes (e.g. 001, 003, 005) or blocks of matrix codes (e.g. 010-020, 050-100) as required. A list of the matrix-to-ECC assignments is given in Table B3.

Data: 377 Rep-Rates (Labor Force Separation Rates)

Medium: Card Deck

Use: Input Data for Program SQUEEZE

Description:

The 377 Rep-Rate data deck specifies a replacement rate for each of the 377 occupational categories of the matrix. These rates indicate the proportion of total employment in a given occupation that will be replaced in a given year due to death, retirement, and other reasons of separation from the labor force in a specified year. The source for these data was the Bureau of Labor Statistics. A separate deck of replacement rates is prepared for to be used with both the historical and the projected employment matrix. Rates used in the current forecast are shown in Table B4.

Data: ECC Employment Forecast

Medium: Card Deck

Use: Input into Program DEMAND

Description:

The ECC forecast deck provides projected employment in each of the economic categories for seven years. There is one card for each economic category, excluding the total jobs category. The ECC forecast must be annual average employment values. They may be by calendar year or by fiscal year. The forecasts produced by the Program DEMAND will correspond to the years selected for the ECC forecast. A discussion of how the economic forecast was adapted for use with the employment matrix is given at the end of Appendix B. Presented with this discussion are forecast values used as input for the current forecast.

If the desired forecast period exceeds six years (the first of seven annual values is used as a base for the expansion computation) additional ECC forecast decks must be prepared. Each deck becomes input for a separate run of Program DEMAND.

Program: CONVERT

Language: FORTRAN

Purpose:

Conversion of matrix employment data from BCD code to unformatted binary integers to permit efficient processing by Program SQUEEZE.

Program Input:

BLS Matrix Tape as modified by ES.

Program Output:

A tape containing only the detailed categories from the input tape but in binary form.

Program Limitations:

This program is designed to be run once, allowing subsequent runs of Program SQUEEZE to be made efficiently and at great savings in cost.

Program: CHECK

Language: FORTRAN

Purpose:

The program checks the Matrix-to-OE assignment deck for coding errors before the deck is submitted to Program MATRIX.

Program Input:

The Matrix-to-OE assignment deck and the OE-Name deck.

Program Calculation:

The OE-Name deck is read and OE-Codes on each continuation card are matched with the corresponding OE-Code on the preceding "R" or "D" OE-Program. The Matrix-to-OE assignment deck is read and checks are made against the following criteria:

1. The OE-Code on an assignment card matches a valid "R" code from the OE-Name deck;
2. Occupational codes in the assignment deck ascend or remain the same, but do not descend in value;
3. Industry and occupation codes are within a specified range;
4. Industry codes on a given card are in ascending order;
5. No duplication of industry codes are made on any of several cards belonging to a given occupation;
6. Delimiters between industry codes are either a dash, a comma, or a slash. In the case of a slash, the industry string is continued on the following card;
7. Each string of industry assignments ends with a blank delimiter;
8. Within a set of assignment cards to be shared among several OE-Programs the string of industry codes on each card are identical;

9. All coefficients in a set of shared assignments sum to 1.0;

10. There are no more than 10 OE-Programs in a set of shared assignments

Program Output:

The input decks are listed together with error messages for any cards that fail to meet the above criteria.

Program: MATRIX

Language: FORTRAN

Purpose:

The program generates a comprehensive set of coded instructions from the "shorthand" assignment codes of the matrix-to-OE code deck. These instructions will be used to direct the "squeeze" of the employment matrix along occupational lines to match the regular OE-Programs in the OE-name list.

The program also has a set of run options that will list errors in the code deck. Also included in these run options is the production of two cross-reference index tables. The first index displays the matrix-to-OE assignment codes in order of the OE-Programs. The second index displays the same codes in order of matrix occupations.

Program Input:

The OE-name deck and the matrix-to-OE assignment code deck. These are described in separate write-ups. The assignment deck should have been previously checked thoroughly during preparation and by a computer Program CHECK to assure the interrelations of the various codes are consistent with the logic of Program MATRIX. Only minimal checks of the input are conducted within Program MATRIX to insure that input parameters do not exceed allocated core storage.

Program Computations:

The program's main task is to produce an assignment matrix of 377 x 184 occupational assignments, i.e. an assignment for each cell in the matrix. This is accomplished by assigning a location number (unique to each OE-Program) to the matrix occupation-industry cells specified in

the matrix-to-OE code deck. If an occupation-industry cell is not specified, it is assigned to a default OE-Program called "Other Occupations." If a shared or coefficient assignment is indicated for a given OE-Program, instructions are stored in a separate code matrix. If the matrix-to-OE coding directs the assignment of the same census matrix cell to more than one OE-Program without a share coefficient being specified, only the final instruction (OE-Program assignment) will be followed.

Program Output:

The program produces data file MX which is made available for future use by Program SQUEEZE. This file includes the OE-name deck, the 377 x 184 occupational assignment matrix and the share coefficients matrix. Also produced, if the proper run option is selected, are cross-reference index tables.

Program: SQUEEZE

Language: FORTRAN

Purpose:

The program computes staffing ratios and replacement rates for the regular OE-Programs in the OE-name deck. The program can be run twice, first using the historic matrix, then using the projected matrix. Separate sets of replacement rates accompany each matrix. Both of the resulting output files are accepted by Program DEMAND and trended to give a more accurate representation of staffing and replacement patterns in any given year of the forecast period. The description below will describe the procedure for one matrix. All of the input for the second matrix remains unchanged except for the replacement rates.

Program Input:

From Program MATRIX, via data file MX, comes the OE-name list, the 377 x 184 assignment code matrix and the share coefficient matrix. From an input card deck comes the 377 replacement rates for a year matching the matrix, the ECC name list and the matrix-to-Ecc assignment codes. All of these decks have been discussed previously. Finally, in an industry-by-industry process, the full matrix employment tape (either historic or projected) is read as input.

Program Computation:

The employment matrix is compressed in a two-step operation into an OE-ECC employment matrix. First, according to the 377 x 184 assignment matrix from Program MATRIX, the matrix occupations for specified blocks of matrix industries are compressed to match the OE-Programs. Individual matrix cells are shared among several OE-Programs if directed by the share coefficient

matrix. The second step compresses the matrix industries into the economic categories. Here, the matrix-to-ECC assignments provide instructions for the squeeze. During the process the replacement rates for the 377 matrix occupational categories are averaged according to an employment weighting to produce replacements rate for each OE-Program.

Following the construction of the OE-ECC employment matrix, totals are summed along OE lines. These totals, representing statewide employment corresponding to each economic category, become the denominators of the staffing ratios. The numerators are the specific employment values in each OE-Program for the given economic category. Thus each element of the OE-ECC employment matrix has a corresponding cell in the OE-ECC staffing ratio matrix. The staffing ratios represent the proportion of employment in a given economic category that is applicable to a given OE-Program. The sum of the staffing ratios for all OE-Programs in a given ECC is equal to 1.0.

Mathematically, the squeeze process can be described by the summation of the census employment (E) according to two sets of directions. The matrix-to-OE assignment codes are symbolized by $d1$, giving the correspondence between each of the 377 matrix occupations (j) and the OE-Programs (v). These directions are not necessarily the same for each matrix industry but vary according to the 377 x 184 code matrix generated by Program MATRIX. The matrix-to-ECC assignment codes are symbolized by $d2$, giving the correspondence between each of the 184 census industries (i) and the economic categories (e). The two-step squeeze for $j = 1, 377$ and $i = 1, 184$ can be expressed as:

$$E_{vi} = \sum_{j=d1} E_{ji},$$

$$E_{ve} = \sum_{i=d2} E_{vi},$$

for each economic category (e) and each OE-Program (v). Keep in mind that $d1$ is a function of both j and i, while $d2$ is a function of i only.

The staffing ratio (S) computation can be expressed as:

$$S_{ve} = E_{ve}/E_e,$$

where

$$E_e = \sum_v E_{ve}.$$

The employment weighted averaging of the 377 replacement rates (P) for the census occupations into replacement rates (Q) corresponding to employment applicable to the OE-Programs can be expressed as:

$$Q_v = T_v/E_v,$$

where

$$T_v = \sum_e \sum_{j=d1} \sum_{i=d2} P_j \cdot E_{ji},$$

and

$$E_v = \sum_e \sum_{j=d1} \sum_{i=d2} E_{ji}.$$

Program Output:

The program produces data file SQ1 which is saved for subsequent use by Program DEMAND. The file includes the OE-name list, the OE-replacement rates, and the OE-staffing ratios. Also produced is a set of tables, one for each OE-Program, giving the computed replacement rate, the matrix employment by economic category applicable to that program, and a set of staffing ratios for the economic categories. File SQ2 is created similarly from the projected ES/BLS matrix. A sample output page is shown in Table B5.

Program: DEMAND

Language: FORTRAN

Purpose:

To produce a six-year employment and job demand forecast for each OE-Program.

Program Input:

The staffing ratios and replacement rates computed by Program SQUEEZE are read from data file SQ1 (the historical matrix) and from file SQ2 (the projected matrix). Also read from a data file are the OE-names. Seven-year employment forecasts for the economic categories are read from a card deck.

Program Computations:

Staffing ratios and replacement rates for a given year in the forecast period are trended using linear interpolation. Staffing ratios are also extrapolated to years before or after the years of the two input matrices, if needed to complete a forecast period. However, replacement rates are not extrpolated, but held constant, if values are needed outside the range of years for which the input was determined.

A seven-year employment forecast for each OE-Program is computed for each economic category by taking the product of the staffing ratio for that OE-Program and the corresponding economic category forecast:

$$F_{evt} = S_{evt} \cdot E_{et},$$

where F is the computed employment forecast, S is the staffing ratio computed earlier from matrix data, and E is the given economic category forecast; all for the eth economic category, the vth OE-Program, and the tth year.

The forecasts are then summed over the economic categories to give total employment for each OE-Program in each year:

$$F_{vt} = \sum_{e} F_{evt}.$$

The following computations are performed for each OE-Program. Employment expansion (X) is computed each of six years by taking differences between consecutive years in the seven-year OE-Program employment forecast:

$$X_{vp} = F_{vp} - F_{vt},$$

where $p = t + 1$ and $t = 1, 2...6$. Thus, no expansion is computed for the first of the seven years. If employment is declining, a negative expansion will be computed. A replacement needs forecast (R) is computed for each of six years by taking the product of the weighted-average replacement rate (Q) computed by Program SQUEEZE and the employment forecast for a given year:

$$R_{vp} = Q_{vp} \cdot F_{vp},$$

where $p = t + 1$. Again the computation is for the second through the seventh of the original seven-year forecast period; $t = 1, 2,...6$. Job demand (D) is then simply the total of the corresponding expansion and replacement values in a given period:

$$D_{vp} = X_{vp} + R_{vp}.$$

In addition to the individual forecasts for each OE-Program, various aggregate forecasts are produced. These include summary (cluster) totals, field totals, section totals and a total forecast including all of the above. This total forecast will match the total jobs specified in the economic category input.

Program Output:

Tables displaying six-year forecasts are produced for the individual and aggregate programs. The tables display the field title, cluster title, and OE-Program title appropriate for the individual forecast. Also shown are the comments intended for the individual OE-Program. The forecast data on each table includes employment, expansion, replacement, demand and replacement rates in each of six years. A sample output page is shown in Table B6.

The program produces data file DM which is saved for use by other computer programs that may be added to the system in the future. Included in this file are the six-year employment, expansion, replacement and demand forecasts for each individual OE-Program.

APPENDIX A

TABLES AND FIGURES
SUPPORTING THE OCCUPATIONAL
EDUCATION FORECASTING SYSTEM

APPENDIX

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GLOSSARY

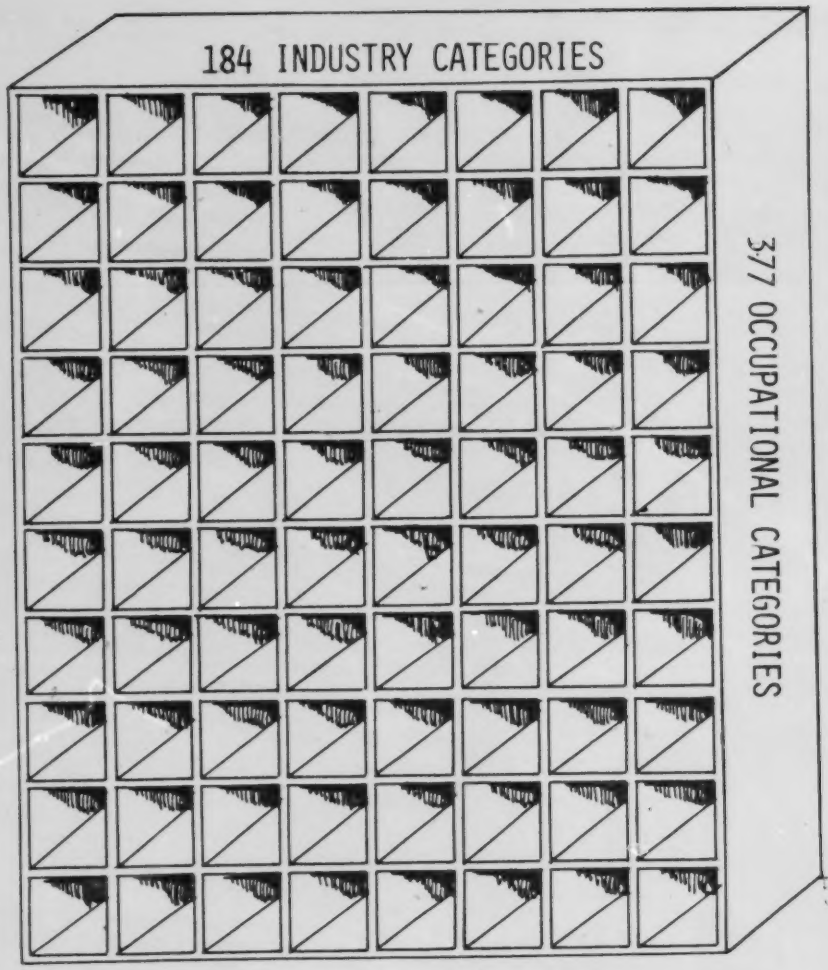
Attrition	Job vacancies created by persons leaving their jobs due to various labor separation reasons, which are not being filled.
Demand	Job opportunities or anticipated employment, due to expansion (new jobs) and replacement (filling vacancies caused by labor force separation).
Economic Category (ECC)	Industry categories for which employment projections are supplied to the forecast system.
Expansion	New jobs created by employment growth; a negative expansion indicates a decline in employment from the previous level.
OE-Program	Educational programs classified by the U.S. Office of Education (HEW). The forecasting system deals only with those programs applicable to vocational education.
Replacement	Job vacancies, which are being filled, created by persons leaving their jobs due to death, retirement, out-migration, quits, discharges and other labor separation reasons. Does not include occupational shifts within the labor force.

Replacement Rates	Proportion of employment in a given occupational category that will be replaced in a given year. Within the model replacement rates are specified for the occupational categories of the matrix and computed for the vocational categories of the OE-Programs. Replacement rates are also referred to as labor force separation rates.
Staffing Ratios	Proportion of employment in a given economic category applicable to a given OE-Program. Thus, these ratios represent the share of employment in an industry devoted to a given occupation.

Note: A more extensive glossary is presented at the close of the Appendix in the companion to this report, the *Summary of Findings*.

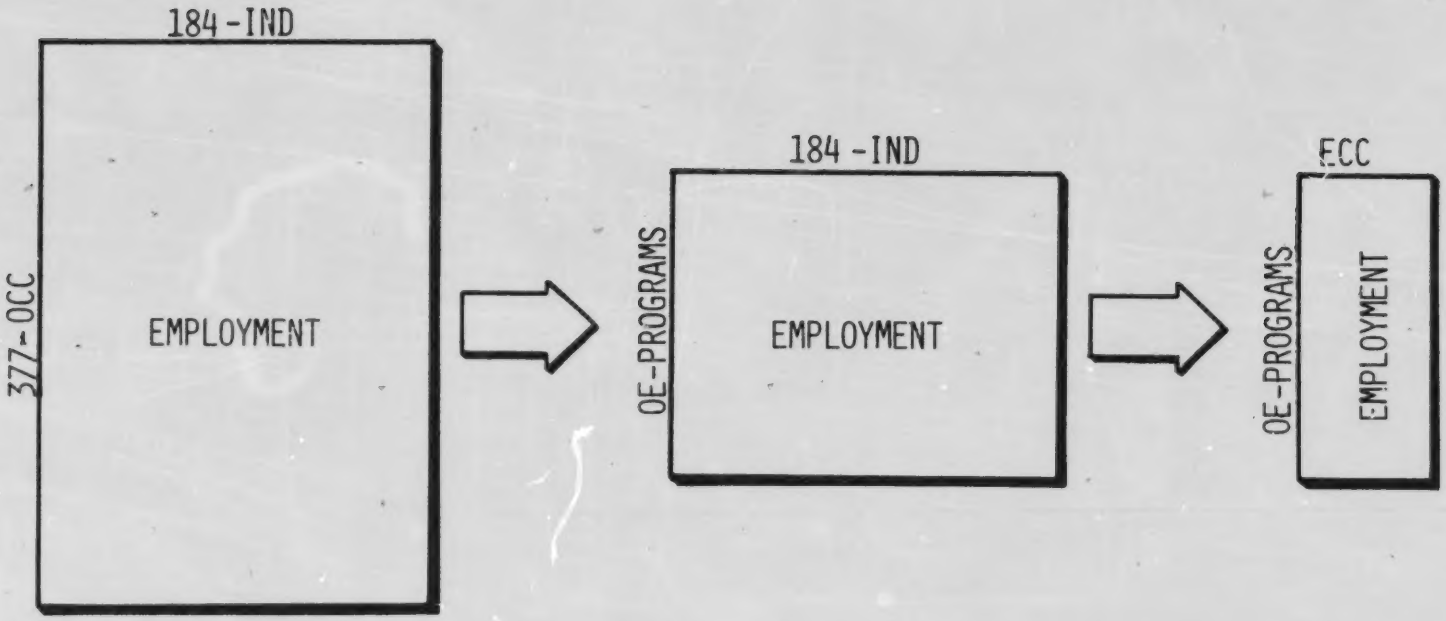
FIGURE A1
THE INDUSTRY-OCCUPATION MATRIX

- A CUPBOARD WITH 70 THOUSAND CUBBYHOLES
- EACH CUBBYHOLE CONTAINS EMPLOYMENT FOR A SPECIFIC INDUSTRY AND OCCUPATION
- MATRIX TAPE AVAILABLE FOR SEVERAL DIFFERENT YEARS



IND-OCC MATRIX

FIGURE A2
SAMPLE SQUEEZE OPERATION



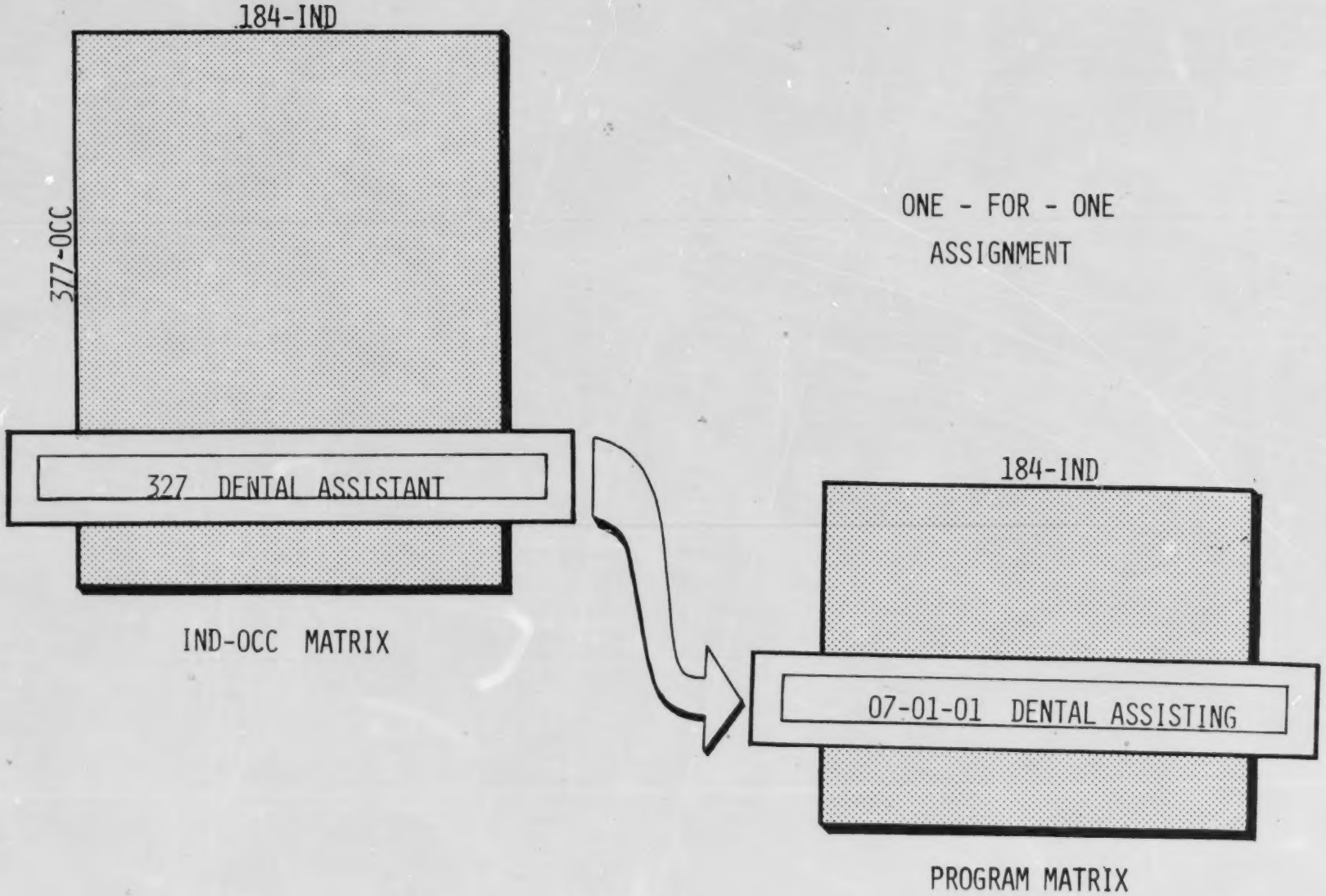
1. IND-OCC
CENSUS MATRIX

2. OCCUPATION
SQUEEZE
MATRIX OCCUPATIONS
TO OE-PROGRAMS

3. INDUSTRY
SQUEEZE
MATRIX INDUSTRIES
TO ECONOMIC
CATEGORIES

FIGURE A3

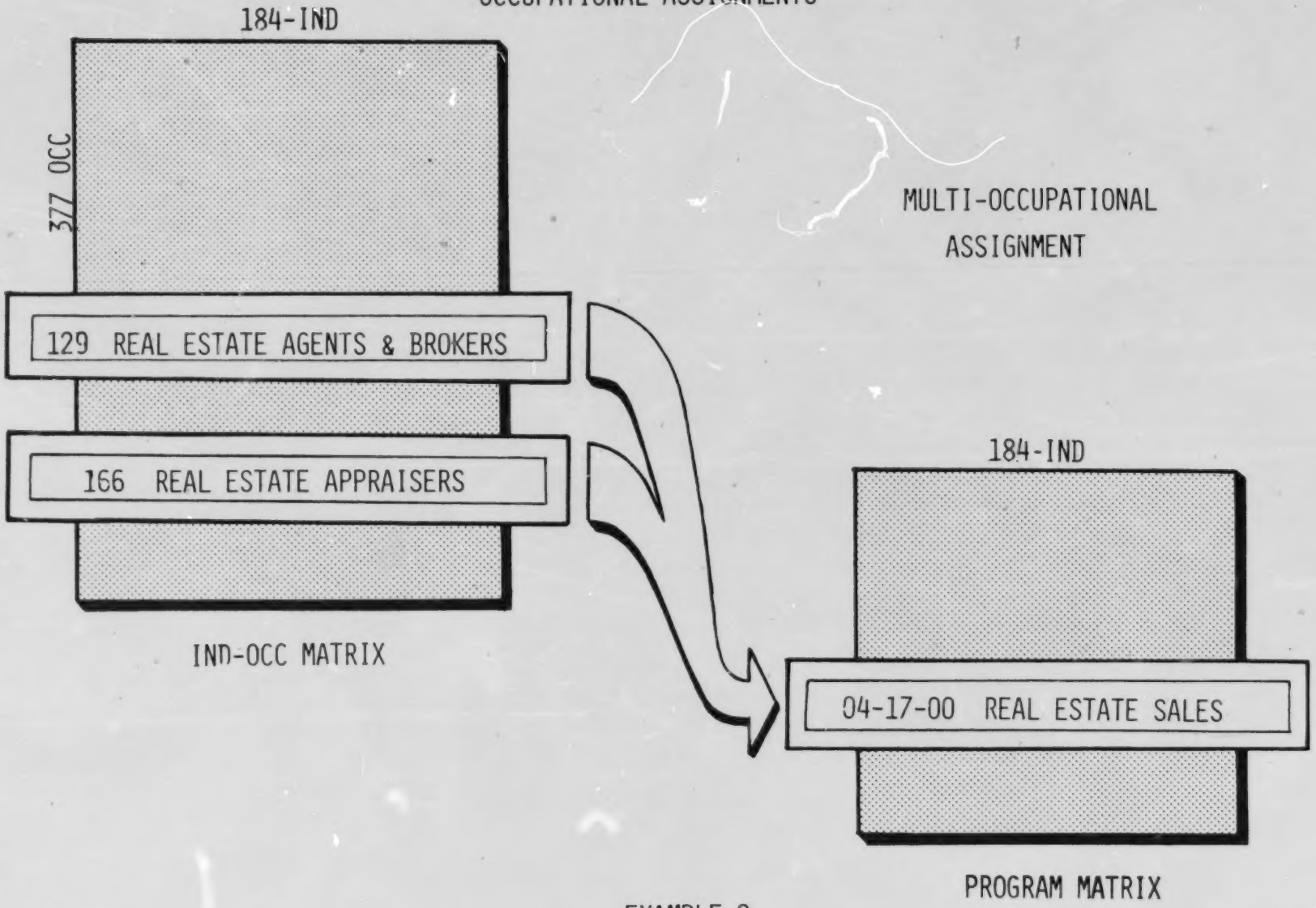
OCCUPATIONAL ASSIGNMENTS



EXAMPLE 1

FIGURE A4

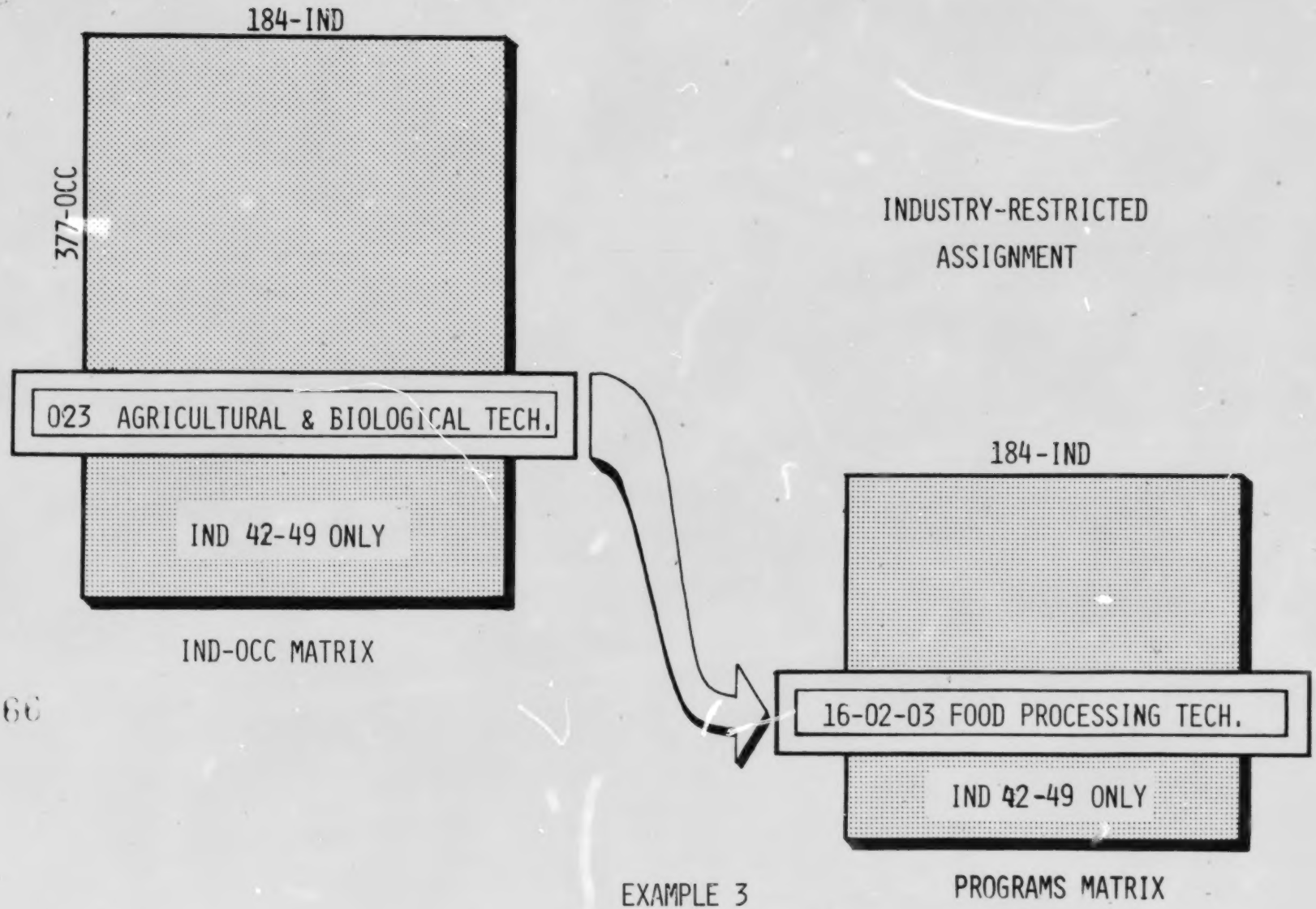
OCCUPATIONAL ASSIGNMENTS



EXAMPLE 2

FIGURE A5

OCCUPATIONAL ASSIGNMENTS



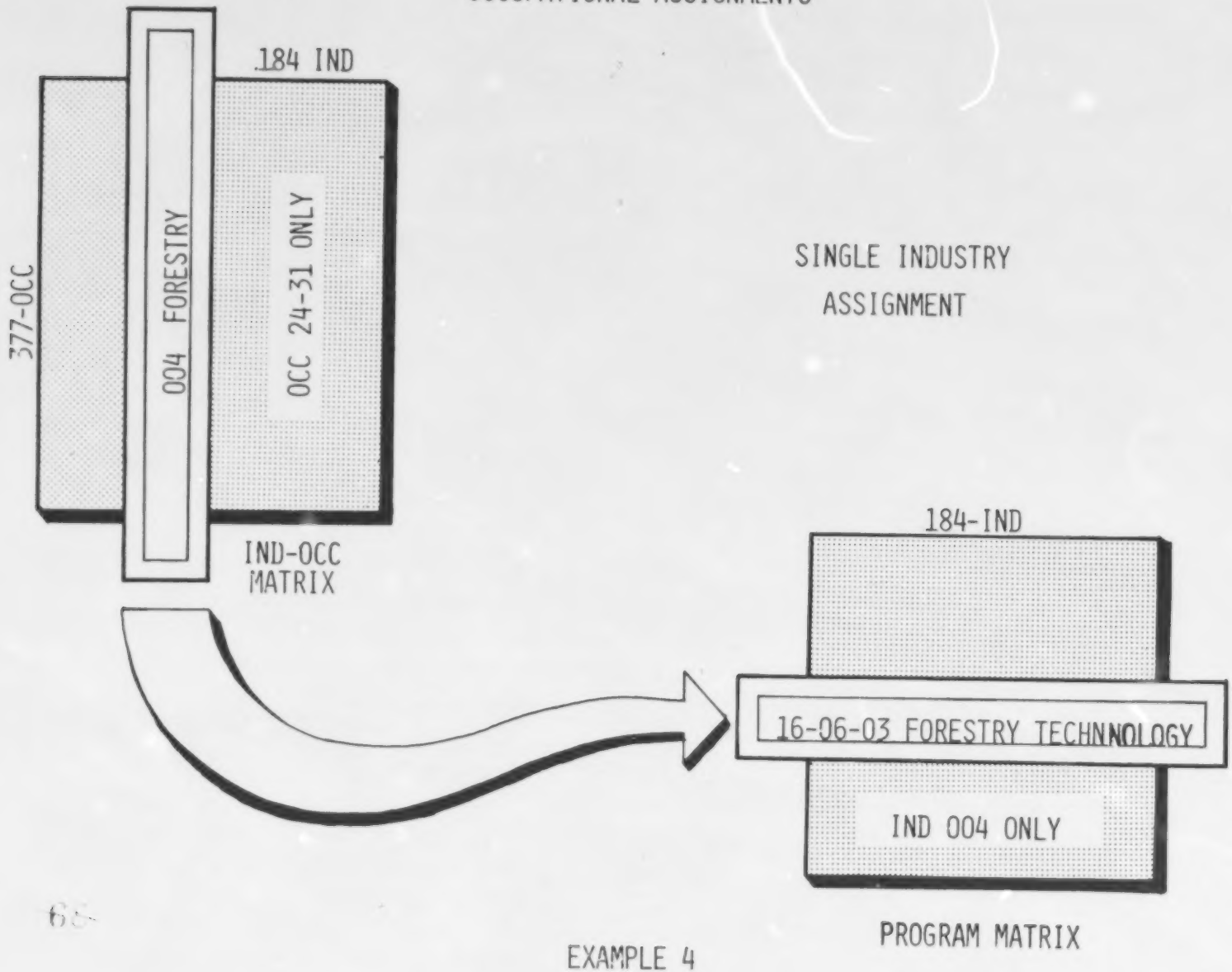
IND-OCC MATRIX

EXAMPLE 3

PROGRAMS MATRIX

FIGURE A6

OCCUPATIONAL ASSIGNMENTS



EXAMPLE 4

FIGURE A7
OCCUPATIONAL ASSIGNMENTS

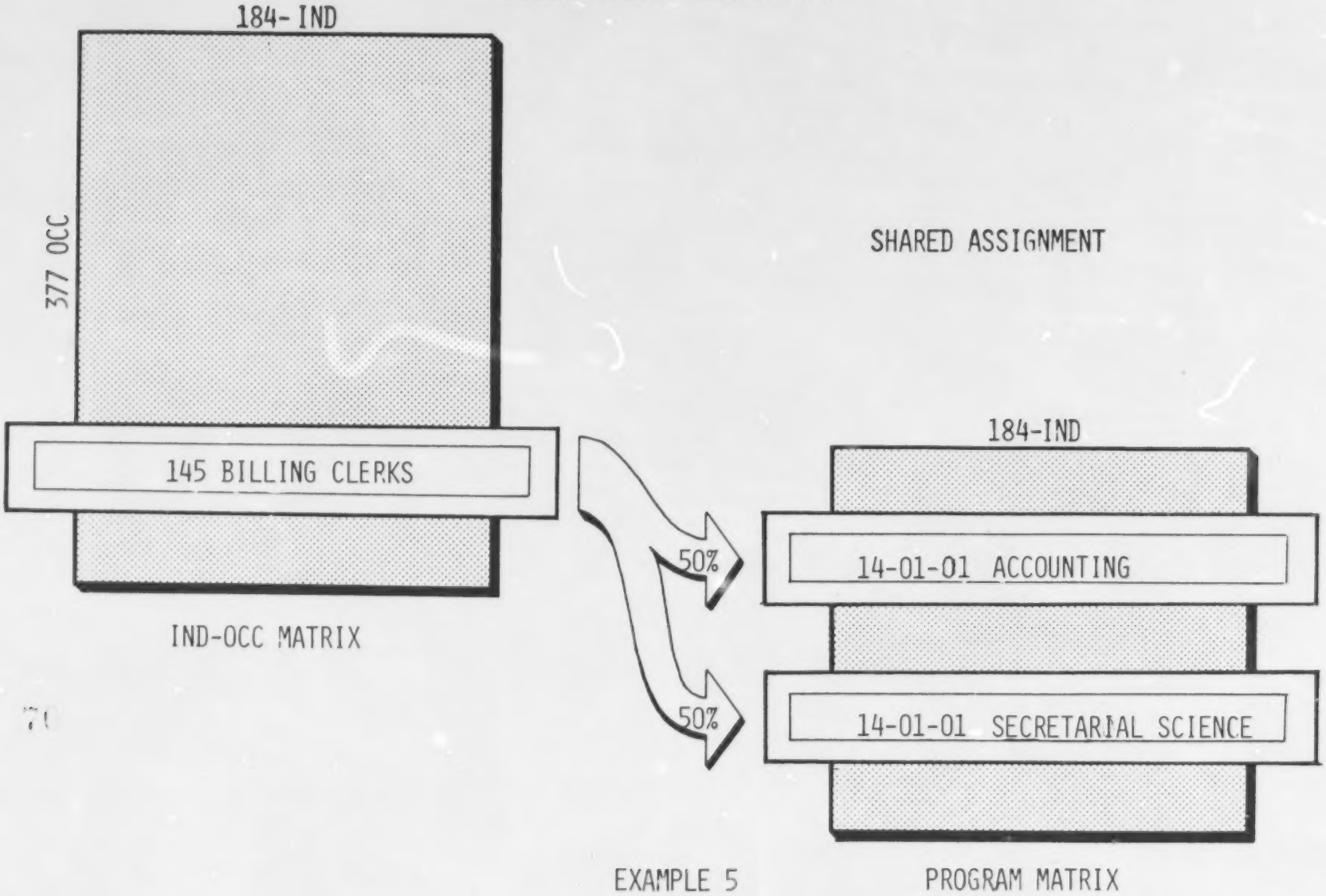


FIGURE A8

SAMPLE MATRIX TO ECONOMIC CATEGORY ASSIGNMENTS

	Category	BLS-184 Sequential Codes	SIC
1.01	AGRICULT	001	01,02
1.02	FOOD, KIND	042 049	20
1.03	PULP PAPR	054-055	26
1.04	APPAREL	052 053	23
1.05	PRINTING	056-057	27
1.06	CHEMICALS	058-065	28
1.07	PETROLEUM	066-067	29
1.08	OTR-NDURA	050-051, 068-071	21, 30, 31
1.09	LUMB, WOOD	010-012	24
1.10	FURNITURE	013	25
1.11	STN-CLA-GL	014-018	32
1.12	FR-FAB MET	019, 022-026	33F, 34
1.13	N-FER MET	020-021	33NF
1.14	OTHER MACH	027-033	35
1.15	ELECT MACH	034-036	36
1.16	AEROSPACE	038	372
1.17	SHIPBUILD	039	373
1.18	OTHER TRAN	037, 040	37 (exc. 372, 373)
1.19	OTHER DURA	041	19, 38, 39
1.20	MINING	006	10, 12, 13, 14
1.21	CONSTRUCT	007-009	15-17
1.22	TRAN SERV	072-080	40-42, 44-47
1.23	COMM, UTIL	081-089	48, 49
1.24	WHOLESALE	090-104	50, 52
1.25	RETAIL	105-131	53-59
1.26	FIN-INS-RE	132-136	60-67
1.27	SERVICES	002-005, 137-180	07-09, 70-89
1.28	STLO-ADMIN	183-184	92-93
1.29	FEDL-ADMIN	181-182	91

Note: Sequential matrix codes are defined in Table A2.

FIGURE A9

VOCATIONAL EMPLOYMENT FORECASTS PROCEDURE

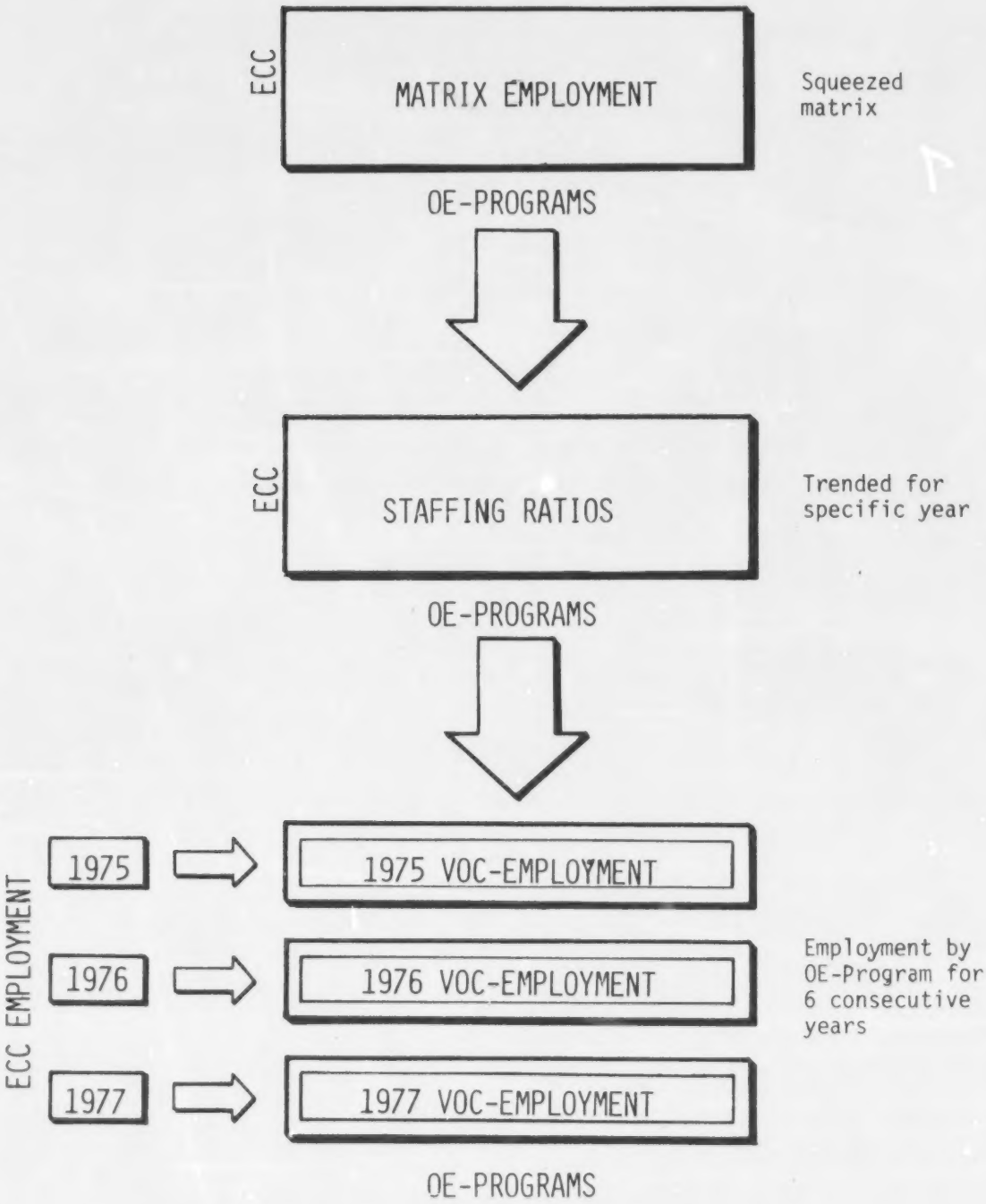


FIGURE A10

JOB OPPORTUNITIES FORECAST PROCEDURE
FOR SAMPLE OE-PROGRAM IN 1979

1979 EXPANSION = 1979 EMPLOYMENT - 1978 EMPLOYMENT

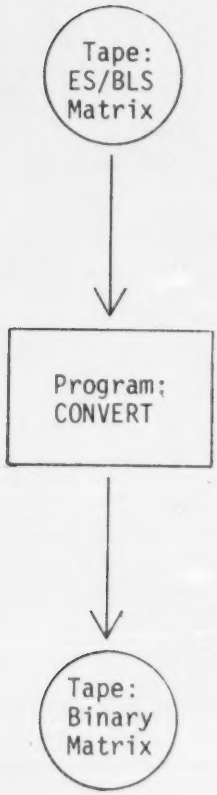
1979 REPLACEMENT = 1979 EMPLOYMENT x 1979 REPLACEMENT RATE

1979 DEMAND = 1979 EXPANSION + 1979 REPLACEMENT

Figure A11

Matrix Tape Binary Conversion

Computer Program Flow Chart



BLS Matrix has been previously processed by ES to "roll up" selected industries. Includes both detailed and summary employment for a given year

Selects only detailed data entries, converts from BCD to binary

Industry/Occupation Employment Matrix

Figure A12

Job Opportunities Forecast

Computer Program Flow Chart

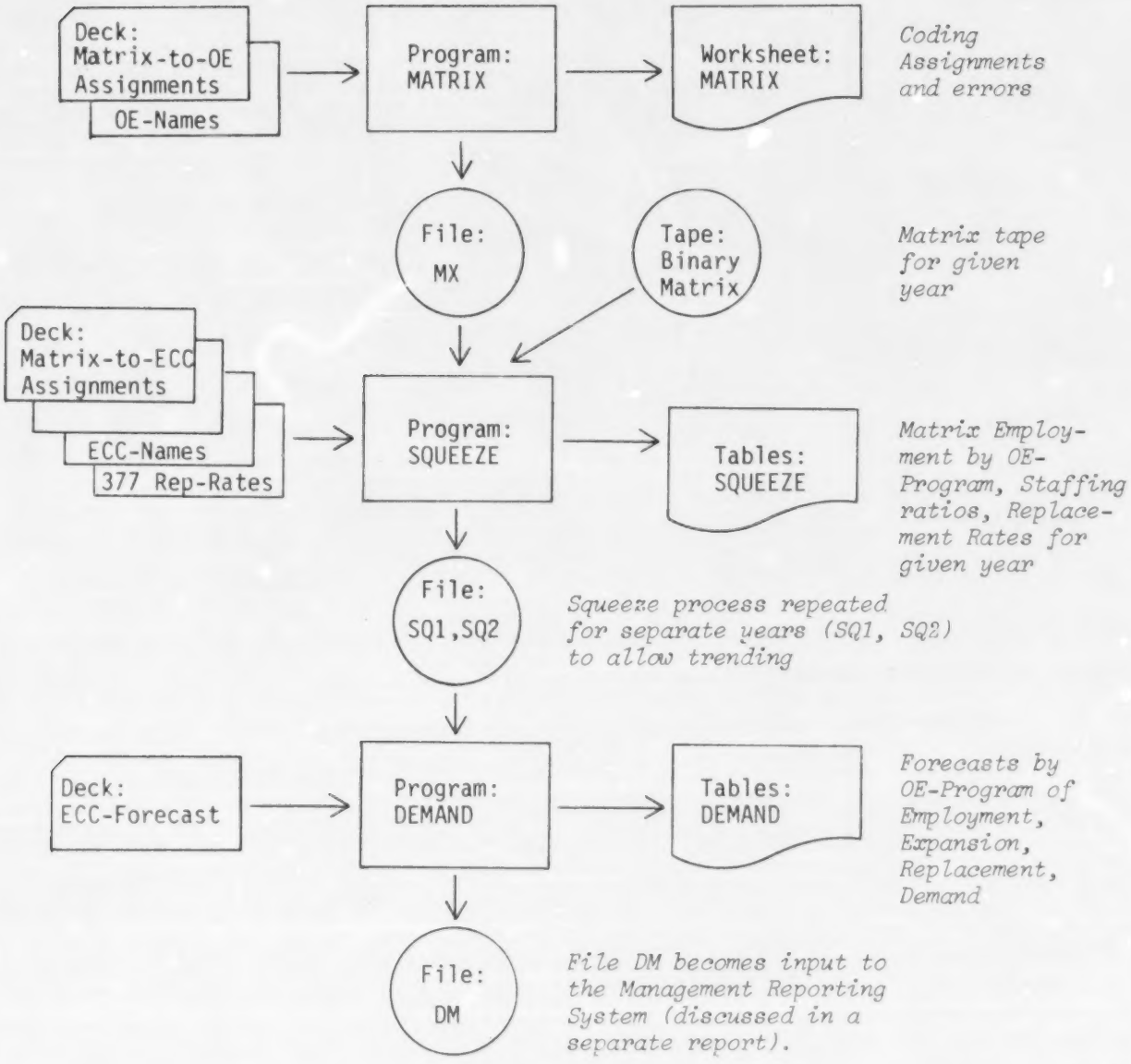


TABLE A1

184 INDUSTRIAL CLASSIFICATION CATEGORIES

184 SEQ	INDUSTRY TITLE	MATRIX CODE	CEN SEQ
	TOTAL EMPLOYMENT	000000	
	AGRICULTURE,FORESTRY,FISHERIES	100000	
	AGRICULTURE	100100	
001	AGRICULTURAL PRODUCTION	100110	001
002	AGRICULTURE SERVICES, EXC HORT	100130	002
003	HORTICULTURAL SERVICES	100170	003
004	FORESTRY	100800	004
005	FISHERIES	100900	005
006	MINING	200000	007-010
	METAL MINING	201000	
	CONSTRUCTION	300000	
007	GENERAL BUILDING CONTRACTORS	301500	012
008	GENERAL CONTRACTORS, EXC BLDG.	301600	013
009	SPECIAL TRADE CONTRACTORS	301700	014
	TOTAL MANUFACTURING	400000	
	DURABLE GOODS	410000	
	LUMBER AND WOOD PRODUCTS,EXCEPT FURNIT	412400	
010	LOGGING	412410	017
011	SAWMILL, PLANNG MILL, MILL WK	412420	018
012	MISC WOOD PROD	412440	019
013	FURNITURE AND FIXTURES	412500	020
	STONE,CLAY AND GLASS PRODUCTS	413200	
014	GLASS AND GLASS PROD	413210	021
015	CEMENT, CONCRETE, PLASTER	413240	022
016	STRUCTURAL CLAY PROD	413250	023
017	POTTERY AND RELATED PROD	413260	024
018	MISC NONMETALLIC, STONE	413280	025
	PRIMARY METAL INDUSTRIES	413300	
019	BLAST FURNACES,STEEL,OTHER PRIMARY	413319	026-027
020	PRIMARY ALUMINUM IND	413330	028
021	OTHER PRIMARY NONFERROUS	413340	029
	FABRICATED METAL PRODUCTS	413400	
022	CUTLERY, OTHER HARDWARE	413420	030
023	FABRICATED METAL PROD	413440	031
024	SCREW MACHINE PROD	413450	032
025	METAL STAMPING	413460	033
026	MISC FABRICATED METAL PROD	413480	034
	MACHINERY,EXCEPT ELECTRICAL	413500	
027	ENGINES AND TURBINES	413510	036
028	FARM MACHINERY, EQUIP.	413520	037
029	CONSTRUCTION MACHINES	413530	038
030	METALWORKING MACHINERY	413540	039
031	OFFICE, ACCOUNTING MACHINES	413560	040
032	ELECTRONIC COMPUTING EQUIP	413570	041
033	MACHINERY, NEC	413590	042
	ELECTRICAL MACHINERY,EQUIPMENT	413600	
034	HOUSEHOLD APPLIANCES	413630	044
035	RADIO, TV, COMMUN EQUIP	413650	045
036	ELECTRICAL MACHINERY, NEC	413690	046
	TRANSPORTATION EQUIPMENT	413700	

TABLE A1 (CONTINUED)

184 INDUSTRIAL CLASSIFICATION CATEGORIES

184 SEQ	INDUSTRY TITLE	MATRIX CODE	CEN SEQ
037	MOTOR VEHICLE EQUIP	413710	048
038	AIRCRAFT AND PARTS	413720	049
039	SHIP, BOAT BUILDING, REPAIR	413730	050
040	OTHER TRANSPORTATION EQUIPMENT	413799	051-053
041	MISCELLANEOUS MANUFACTURING	413809	054-057, 059,060
	NONDURABLE GOODS	420000	
	FOOD AND KINDRED PRODUCTS	422000	
042	MEAT PRODUCTS	422010	062
043	DAIRY PRODUCTS	422020	063
044	CANNING AND PRESERVING	422030	064
045	GRAIN MILL PRODUCTS	422040	065
046	BAKERY PRODUCTS	422050	066
047	CONFECTIONARY PRODUCTS	422070	067
048	BEVERAGE INDUSTRIES	422080	068
049	MISC FOOD PREPARATION	422090	069
050	TOBACCO MANUFACTURING	422100	071
051	TEXTILE MILL PRODUCTS	422200	072-076
	APRL AND OTHER FABRICATED TEXTILE PROD	422300	
052	APPAREL AND ACCESSORIES	422310	077
053	MISC. FABRICATED PRODUCTS	422390	078
	PAPER AND ALLIED PRODUCTS	422600	
054	PULP,PAPER,PAPERBOARD MILLS,CONTRS.	422659	079,081
055	MISC. PAPER AND PULP PRODUCT	422660	080
	PRINTING,PUBLISHING,AND ALLIED PROD	422700	
056	NEWSPAPER PUBLISHING, PRINTING	422710	082
057	PRINTING, PUBLISHING EXC NEWS	422720	083
	CHEMICALS AND ALLIED PRODUCTS	422800	
058	INDUSTRIAL CHEMICALS	422810	084
059	PLASTICS, SYNTHETICS	422820	085
060	SYNTHETIC FIBERS	422830	086
061	DRUGS AND MEDICINES	422840	087
062	SOAPS AND COSMETICS	422850	088
063	PAINTS, VARNISHES	422860	089
064	AGRICULTURAL CHEMICALS	422870	090
065	MISC CHEMICALS	422890	091
	PETROLEUM AND COAL PRODUCTS	422900	
066	PETROLEUM REFINING	422910	093
067	MISC. PETROLEUM, COAL PROD	422980	094
	RUBBER AND MISC PLASTIC PRODUCTS	423000	
068	RUBBER PRODUCTS	423010	095
069	MISC PLASTIC PRODUCTS	423070	096
	LEATHER AND LEATHER PRODUCTS	423100	
070	LEATHER TANNING,FOOTWEAR EXC RUBBER	423119	097-098
071	ALL OTHER LEATHER PRODUCTS	423180	099
	TRANS,COMM,AND OTHER PUBLIC UTILITIES	500000	
	TRANSPORTATION	510000	
072	RAILROADS, RAILWAY EXPRESS	514000	102
	LOCAL,INTERURBAN TRANSIT	514100	
073	STREET RAILWAYS, BUS LINE	514110	103

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TABLE A1 (CONTINUED)

184 INDUSTRIAL CLASSIFICATION CATEGORIES

184 SEQ	INDUSTRY TITLE	MATRIX CODE	CEN SEQ
074	TAXICAB SERVICE	514120	104
	TRUCKING AND WAREHOUSING	514200	
075	TRUCKING SERVICE	514210	105
076	WAREHOUSING AND STORAGE	514220	106
077	WATER TRANSPORTATION	514400	107
078	AIR TRANSPORTATION	514500	108
079	PIPELINES	514600	109
080	TRANSPORTATION SERVICES	514700	110
	COMM,UTILITIES,SANITARY	520000	
	COMMUNICATIONS	524800	
081	TELEPHONE WIRE AND RADIO	514810	111
082	TELEGRAPH, MISC COMMUN SERV	524820	112
083	RADIO BROADCASTING, TV	524830	113
	UTILITIES AND SANITARY SERVICES	524900	
084	ELECTRIC LIGHT AND POWER	524910	114
085	ELECTRIC-GAS UTILITIES	524920	115
086	GAS, STEAM SUPPLY SYSTEMS	524930	116
087	WATER SUPPLY	524940	117
088	SANITARY SERVICES	524950	118
089	OTHER UTILITIES, NEC	524970	119
	WHOLESALE AND RETAIL TRADE	600000	
	WHOLESALE TRADE	610000	
	WHOLESALE,EXCEPT MISC WHOLESALE	615000	
090	MOTOR VEHICLES AND EQUIP	615010	121
091	DRUGS, CHEMICALS, ALLIED PROD	615020	122
092	DRY GOODS AND APPAREL	615030	123
093	FOOD AND RELATED PROD	615040	124
094	FARM PROD-RAW MATERIAL	615050	125
095	ELECTRICAL GOODS	615060	126
096	HARDWARE, PLUMBING	615070	127
097	MACHINERY EQUIP, SUPPLIES	615080	129
	MISC WHOLESALE TRADE	615900	
098	METALS AND MINERALS, NEC	615910	130
099	PETROLEUM PRODUCTS	615920	131
100	SCRAP AND WASTE MATERIAL	615930	132
101	ALCOHOLIC BEVERAGES	615950	133
102	PAPER AND ITS PRODUCTS	615960	134
103	LUMBER, CONSTR. MATERIALS	615980	135
104	WHOLESALE, NEC	615990	136
	RETAIL TRADE	620000	
	BUILDING MATERIALS	625200	
105	LUMBER, BUILDING MATERIAL	625210	139
106	HARDWARE AND FARM EQUIPMENT	625250	140
	GENERAL MERCHANDISE,TOTAL	625300	
107	DEPARTMENT, MAIL ORDER	625310	141
108	LIMITED PRICE STORES	625330	142
109	VENDING MACHINE OPERATORS	625340	143
110	DIRECT SELLING	625350	144
111	MISC. MERCHANDISE STORES	625380	145
	FOOD AND DAIRY STORES	625400	

TABLE A1 (CONTINUED)

184 INDUSTRIAL CLASSIFICATION CATEGORIES

184 SEQ	INDUSTRY TITLE	MATRIX CODE	CEN SEQ
112	GROCERY STORES	625410	146
113	DAIRY PROD STORES	625450	147
114	RETAIL BAKERIES	625460	148
115	FOOD STORES, NEC	625490	149
	AUTO DEALERS,GAS STATIONS	625500	
116	MOTOR VEHICLE DEALERS	625510	150
117	TIRE, BATTERY ACCESSORY	625530	151
118	GASOLINE SERVICE STATIONS	625540	152
119	MISC. VEHICLE DEALERS	625590	153
	APPAREL AND ACCESSORIES	625600	
120	APPAREL, ACCESSORIES STORES	625610	154
121	SHOE STORES	615660	155
	FURNITURE AND APPLIANCES	625700	
122	HOME FURNISHING STORES	625710	156
123	APPLIANCE, TV, RADIO STORES	615720	157
124	EATING AND DRINKING PLACES	625800	158
	MISC RETAIL TRADE STORES	625900	
125	DRUG STORES	625910	159
126	LIQUOR STORES	625920	160
127	FARM & GARDEN SUPPLY STORES	625930	161
128	JEWELRY STORES	625940	162
129	FUEL AND ICE DEALERS	625950	163
130	RETAIL FLORISTS	625960	164
131	MISC. RETAIL TRADE STORES	625970	165
	FINANCE,INSURANCE,AND REAL ESTATE	700000	
	FINANCE,TOTAL	706000	
132	BANKING	706010	168
133	CREDIT AGENCIES	706020	169
134	STOCK BROKERS, INVESTMENT	706070	170
135	INSURANCE	706300	171
136	REAL ESTATE, RE LAW INSURANCE	706500	172
	SERVICES,TOTAL	800000	
	HOTELS AND LODGING PLACES	807000	
137	HOTELS AND MOTELS	807010	188
138	LODGING, PLACES, EXC HOTELS	807040	189
	OTHER PERSONAL SERVICES	807200	
139	LAUNDRY, CLEANING	807210	190
140	BEAUTY SHOPS	807230	191
141	BARBER SHOPS	807240	192
142	SHOE REPAIR SHOPS	807250	193
143	DRESSMAKING SHOPS	807260	194
144	OTHER PERSONAL SERVICES	807290	195
	MISC BUSINESS SERVICES	807300	
145	ADVERTISING	807310	174
146	BUSINESS MANAGEMENT SERVICES	807320	178
147	COMMERCIAL R AND D	807330	176
148	COMPUTER PROGRAMMING	807340	179
149	DETECTIVE AND PROTECTIVE	807350	180
150	EMPLOYMENT, TEMPORARY HELP	807360	177
151	SERVICES BUILDINGS	807370	175

TABLE A1 (CONTINUED)

184 INDUSTRIAL CLASSIFICATION CATEGORIES

184 SEQ	INDUSTRY TITLE	MATRIX CODE	CEN SEQ
152	OTHER MISC. BUSINESS SERVICES	807390	181
	AUTOMOBILE REPAIR SERVICES	807500	
153	AUTO REPAIR	807510	183
154	AUTO SERVICES, EXC REPAIR	807530	182
	OTHER REPAIR SERVICES	807600	
155	ELECTRICAL REPAIR SHOP	807620	184
156	OTHER REPAIR SERVICES	807630	185
157	MOTION PICTURES, THEATERS	807800	197
	MISC ENTERTAINMENT	807900	
158	BOWLING ALLEYS, BILLIARDS	807930	198
159	MISC ENTERTAINMENT	807940	199
	MEDICAL,OTHER HEALTH	808000	
160	OFFICES OF PHYSICIANS	808010	201
161	OFFICES OF DENTISTS	808020	202
162	OFFICES OF CHIROPRACTORS	808040	203
163	HOSPITALS	808060	204
164	CONVALESCENT INSTITUTIONS	808070	205
165	HEALTH PRACTITIONERS, NEC	808080	206
166	HEALTH SERVICES, NEC	808090	207
167	LEGAL SERVICES	808100	208
	EDUCATIONAL SERVICES	808200	
168	ELEMENTARY, SECONDARY	808210	209
169	COLLEGES AND UNIVERSITIES	808220	210
170	LIBRARIES	808230	211
171	EDUCATIONAL SERVICES, NEC	808240	212
172	MUSEUMS, ART GALLERIES, ZOOS	808300	214
	NONPROFIT ORGANIZATIONS	808600	
173	RELIGIOUS ORGANIZATIONS	808660	215
174	WELFARE SERVICES	808670	216
175	RESIDENTIAL WELFARE	808680	217
176	NONPROFIT MEMBERSHIP	808690	218
177	PRIVATE HOUSEHOLDS	808800	197
	OTHER PROFESSIONAL,RELATED SERVICES	808900	
178	ENG AND ARCH SERVICES	808910	219
179	ACCOUNTING, AUDITING	808980	220
180	MISC. PROFESSIONAL SERVICES	808990	221
	FEDERAL, STATE, LOCAL PUBLIC ADMIN.	900000	
	FEDERAL GOVERNMENT PUBLIC ADMIN	909100	
181	FEDERAL POSTAL SERVICE	909120	223
182	FEDERAL GOVERN. ADMIN. EXC. POSTAL	909190	224
183	STATE GOVERNMENT ADMINISTRATION	909200	225
184	LOCAL GOVERNMENT ADMINISTRATION	909300	226

Note: Matrix codes refer to BLS employment matrix as adapted for JOF use by Employment Security. The 184 sequential codes count the detailed categories that appear on the HRPI version of the matrix. The census sequential codes refer to corresponding categories from the 1970 Manpower tallies. See Technical Report for JOF II.

TABLE A2

377 OCCUPATIONAL CLASSIFICATION CATEGORIES

377 SEQ	OCCUPATION TITLE	MATRIX CODE	CEN SEQ
	TOTAL, ALL OCCUPATIONS	00000000	
	PROFESSIONAL, TECHNICAL, KINDRED	10000000	
	ENGINEERS, TECHNICAL	10020000	
001	ENGINEERS, AERO-ASTRONAUTIC	10020050	006
002	ENGINEERS, CHEMICAL	10020100	007
003	ENGINEERS, CIVIL	10020150	008
004	ENGINEERS, ELECTRICAL	10020200	009
005	ENGINEERS, INDUSTRIAL	10020250	010
006	ENGINEERS, MECHANICAL	10020300	011
007	ENGINEERS, METALLURGICAL	10020350	012
008	ENGINEERS, MINING	10020400	013
009	ENGINEERS, PETROLEUM	10020450	014
010	ENGINEERS, SALES	10020500	015
011	ENGINEERS, OTHERS	10020550	016
	LIFE AND PHYSICAL SCIENTISTS	10040000	
012	AGRICULTURAL SCIENTISTS	10040050	027
013	ATMOSPHERIC, SPACE SCIENTISTS	10040100	028
014	BIOLOGICAL SCIENTISTS	10040150	029
015	CHEMISTS	10040200	030
016	GEOLOGISTS	10040250	031
017	MARINE SCIENTISTS	10040300	032
018	PHYSICISTS AND ASTRONOMERS	10040350	033
019	LIFE, PHYSICAL SCIENTISTS NEC	10040400	034
	MATHEMATICAL SPECIALISTS	10060000	
020	ACTUARIES	10060050	024
021	MATHEMATICIANS	10060100	025
022	STATISTICIANS	10060150	026
	ENGINEERS, SCIENCE TECHNICIANS	10080000	
023	AGRI, BIOLOG TECH EXC HEALTH	10080050	094
024	CHEMICAL TECHNICIANS	10080100	095
025	DRAFTERS	10080150	096
026	ELECTRICAL, ELECTRONIC TECH	10080200	097
027	INDUSTRIAL ENGINEERING TECH	10080250	098
028	MATHEMATICAL TECHN	10080300	099
029	MECHANICAL ENGINEERING TECH	10080350	100
030	SURVEYORS	10080400	101
031	ENGINEERING, SCIENCE TECH NEC	10080450	102
	MEDICAL WORKERS, EXC TECH	10100000	
032	CHIROPRACTORS	10100050	037
033	DENTISTS	10100100	038
034	DIETITIANS	10100150	045
035	OPTOMETRISTS	10100200	039
036	PHARMACISTS	10100250	040
037	PHYSICIANS, MD & OSTEOPATHS	10100300	041
038	PODIATRISTS	10100350	042
039	REGISTERED NURSES	10100400	046
040	THERAPISTS	10100450	047
041	VETERINARIANS	10100500	043
042	OTHER MEDICAL AND HEALTH WORKERS	10100550	044
	HEALTH TECHNOL AND TECH	10120000	

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TABLE A2 (CONTINUED)

377 OCCUPATIONAL CLASSIFICATION CATEGORIES

377 SEQ	OCCUPATION TITLE	MATRIX CODE	CEN SEQ
043	CLINICAL LAB TECHNOL, TECH	10120050	048
044	DENTAL HYGIENISTS	10120100	049
045	HEALTH RECORD TECHNOL, TECH	10120150	050
046	RADIOLOGIC TECHNOL, TECH	10120200	051
047	THERAPY ASSISTANTS	10120250	052
048	OTHER HEALTH TECHNOL, TECH	10120300	053
	TECHNICIANS, EXC HEALTH	10140000	
049	AIRPLANE PILOTS	10140050	103
050	AIR TRAFFIC CONTROLLERS	10140100	104
051	EMBALMERS	10140150	105
052	FLIGHT ENGINEERS	10140200	106
053	RADIO OPERATORS	10140250	107
054	TOOL PROGRAMMERS, NUMERICAL	10140300	108
055	OTHER TECHNICIANS EXC HEALTH	10140350	109
	COMPUTER SPECIALISTS	10160000	
056	COMPUTER PROGRAMMERS	10160050	003
057	COMPUTER SYSTEMS ANALYSTS	10160100	004
058	OTHER COMPUTER SPECIALISTS	10160150	005
	SOCIAL SCIENTISTS	10180000	
059	ECONOMISTS	10180050	056
060	POLITICAL SCIENTISTS	10180100	057
061	PSYCHOLOGISTS	10180150	058
062	SOCIOLOGISTS	10180200	059
063	URBAN AND REGIONAL PLANNERS	10180250	060
064	OTHER SOCIAL SCIENTISTS	10180300	061
	TEACHERS	10200000	
065	ADULT EDUCATION TEACHERS	10200050	089
066	COLLEGE AND UNIVERSITY TEACHERS	10200100	064-088
067	ELEMENTARY SCHOOL TEACHERS	10200550	090
068	PRESCHOOL, KINDERGARTEN	10201050	091
069	SECONDARY SCHOOL TEACHERS	10201150	092
070	TEACHERS NEC, EXC COLL, UNIVER	10201500	093
	WRITERS, ARTISTS, ENTERTAINERS	10220000	
071	ACTORS	10220050	111
072	ATHLETES AND KINDRED WORKERS	10220100	112
073	AUTHORS	10220150	113
074	DANCERS	10220200	114
075	DESIGNERS	10220250	115
076	EDITORS AND REPORTERS	10220300	116
077	MUSICIANS AND COMPOSERS	10220350	117
078	PAINTERS AND SCULPTORS	10220400	118
079	PHOTOGRAPHERS	10220450	119
080	PUBLIC RELATIONS SPECIALISTS	10220500	120
081	RADIO, TV ANNOUNCERS	10220550	121
082	WRITERS, ARTISTS, ENTERTAIN NEC	10220600	122
	OTHER PROFESSIONAL, TECHNICAL	10240000	
083	ACCOUNTANTS	10240050	001
084	ARCHITECTS	10240100	002
085	ARCHIVISTS AND CURATORS	10240150	023
086	CLERGY	10240200	054

TABLE A2 (CONTINUED)

377 OCCUPATIONAL CLASSIFICATION CATEGORIES

377 SEQ	OCCUPATION TITLE	MATRIX CODE	CEN SEQ
087	RELIGIOUS WORKERS, EXC CLERGY	10240250	055
088	FARM MANAGEMENT ADVISORS	10240300	017
089	FORESTERS, CONSERVATIONISTS	10240350	018
090	HOME MANAGEMENT ADVISORS	10240400	019
091	JUDGES	10240450	020
092	LAWYERS	10240500	021
093	LIBRARIANS	10240550	022
094	OPERATIONS, SYSTEMS RESEARCH	10240600	035
095	PERSONNEL LABOR RELATIONS	10240650	036
096	RESEARCH WORKERS, NEC	10240700	123
097	RECREATION WORKERS	10240750	063
098	SOCIAL WORKERS	10240800	062
099	VOCATIONAL, ED COUNSELORS	10240850	110
	MANAGERS, OFFICIALS, PROPRIETORS	20000000	
	BUYERS, SALES, LOAN MANAGERS	20020000	
100	BANK, FINANCIAL MANAGERS	20020050	126
101	CREDIT MANAGERS	20020100	129
102	BUYERS, SHIPPERS, FARM PROD	20020150	127
103	BUYERS, WHOLESALE, RETAIL	20020200	128
104	PURCHASING AGENTS, BUYERS, NEC	20020250	140
105	SALES MANAGER, RETAIL TRADE	20020300	143
106	SALES MANAGER, EXC RET TRADE	20020350	144
	ADMINISTRATORS, PUB INSPECTORS	20040000	
107	ASSESS, CONTROL, LOC PUB ADMIN	20040050	125
108	CONSTRUCTION INSPECTOR, PUB	20040100	132
109	HEALTH ADMINISTRATORS	20040150	131
110	INSPECTORS, EXC CONSTRUCT PUB	20040200	133
111	OFFICIALS, ADMINS, PUB	20040250	137
112	POSTMASTERS AND MAIL SUPER	20040300	139
113	SCHOOL ADMIN, COLLEGE	20040350	145
114	SCHOOL ADMIN, ELEM, SECONDARY	20040400	146
	OTHER MANAGERS, OFFICIALS, PROPS	20060000	
115	FUNERAL DIRECTORS	20060050	130
116	MGRS, SUPERINTENDENTS, BLDG	20060100	134
117	OFFICE MANAGERS, NEC	20060150	135
118	OFFICERS, PILOTS, PURSERS, SHIP	20060200	136
119	OFFICIALS OF LODGES, UNIONS	20060250	138
120	RAILROAD CONDUCTORS	20060300	141
121	RESTAURANT, CAFE, BAR MGRS	20060350	142
122	OTHER MGRS, ADMINISTRATORS	20060400	147
	SALES WORKERS	30000000	
123	ADVERTISING AGENTS, SALES WORKERS	30000050	149
124	AUCTIONEERS	30000100	150
125	DEMONSTRATORS	30000150	151
126	HUCKSTERS AND PEDDLERS	30000200	152
127	INSURANCE AGENTS, BROKERS, ETC	30000250	153
128	NEWSPAPER CARRIERS AND VENDORS	30000300	154
129	REAL ESTATE AGENTS, BROKERS	30000350	155
130	STOCK AND BOND SALES AGENTS	30000400	156
131	SALES WORKERS,NEC	30000450	157-161

TABLE A2 (CONTINUED)

377 OCCUPATIONAL CLASSIFICATION CATEGORIES

377 SEC	OCCUPATION TITLE	MATRIX CODE	CEN SEC
	CLERICAL WORKERS	40000000	
	STENOGRAPHERS, TYPISTS, SECRE	40020000	
132	SECRETARIES, LEGAL	40020050	194
133	SECRETARIES, MEDICAL	40020100	195
134	SECRETARIES, OTHER	40020150	196
135	STENOGRAPHERS	40020200	199
136	TYPISTS	40020250	206
	OFFICE MACHINE OPERATORS	40040000	
137	BOOKKEEPING, BILLING OPERATORS	40040050	182
138	CALCULATING MACHINE OPERATORS	40040100	183
139	COMPUTER, PERIPHERAL EQUIP	40040150	184
140	DUPLICATING MACHINE OPERATORS	40040200	185
141	KEYPUNCH OPERATORS	40040250	186
142	TABULATING MACHINE OPERATORS	40040300	187
143	OTHER OFFICE MACHINE OPERATORS	40040350	188
	OTHER CLERICAL WORKERS	40060000	
144	BANK TELLERS	40060050	163
145	BILLING CLERKS	40060100	164
146	BOOKKEEPERS	40060150	165
147	CASHIERS	40060200	166
148	CLERICAL ASSIST, SOC WELFARE	40060250	167
149	CLERICAL SUPERVISORS, NEC	40060300	168
150	COLLECTORS, BILL AND ACCOUNT	40060350	169
151	COUNTER CLERKS, EXC FOOD	40060400	170
152	DISPATCHER, STARTER, VEHICLE	40060450	171
153	ENUMERATORS AND INTERVIEWERS	40060500	172
154	ESTIMATORS, INVESTIGATORS, NEC	40060550	173
155	EXPEDITORS, PROD CONTROLLERS	40060600	174
156	FILE CLERKS	40060650	175
157	INSURANCE ADJUST, EXAM	40060700	176
158	LIBRARY ATTENDANTS, ASSISTANT	40060750	177
159	MAIL CARRIERS, POST OFFICE	40060800	178
160	MAIL HANDLER, EXC POST OFFICE	40060850	179
161	MESSENGERS AND OFFICE HELPERS	40060900	180
162	METER READERS, UTILITIES	40060950	181
163	PAYROLL, TIME KEEPING CLERKS	40061000	189
164	POSTAL CLERKS	40061050	190
165	PROOFREADERS	40061100	191
166	REAL ESTATE APPRAISERS	40061150	192
167	RECEPTIONISTS	40061200	193
168	SHIPPING, RECEIVING CLERKS	40061250	197
169	STATISTICAL CLERKS	40061300	198
170	STOCK CLERKS, STORE KEEPERS	40061350	200
171	TEACHERS AIDES, EXC MONITORS	40061400	201
172	TELEGRAPH MESSENGERS	40061450	202
173	TELEGRAPH OPERATORS	40061500	203
174	TELEPHONE OPERATORS	40061550	204
175	TICKET STATION, EXPRESS AGENTS	40061600	205
176	WEIGHERS	40061650	207
177	MISC CLERICAL WORKERS, NEC	40061700	208

TABLE A2 (CONTINUED)

377 OCCUPATIONAL CLASSIFICATION CATEGORIES

377 SEQ	OCCUPATION TITLE	MATRIX CODE	CEN SEQ
	CRAFTS AND KINDRED WORKERS	50000000	
	CONSTRUCTION CRAFTS WORKERS	50020000	
178	CARPENTERS AND APPRENTICES	50020050	220-221
179	BRICK AND STONEMASONS AND APPR	50020150	216-217
180	BULLDOZER OPERATORS	50020250	218
181	CEMENT AND CONCRETE FINISHERS	50020300	223
182	ELECTRICIANS AND APPRENTICES	50020350	229-230
183	EXCAVATING, GRADING, MACH OP	50020450	234
184	FLOOR LAYERS, EXC TILE SETTERS	50020500	235
185	PAINTERS AND APPRENTICES	50020550	272-273
186	PAPERHANGERS	50020650	274
187	PLASTERERS AND APPRENTICES	50020700	278-279
188	PLUMBERS,PIPEFITTERS AND APPRENTICES	50020800	280-281
189	ROOFER AND SLATERS	50020900	286
190	STRUCTURAL METAL CRAFT	50020950	294
191	TILESETTERS	50021000	298
192	BLUE COLLAR WORKERS SUPVR,NEC	50040000	236
	METALWORKING CRAFT WORKERS,EXC MECH	50060000	
193	BLACKSMITHS	50060050	213
194	BOILERMAKERS	50060100	214
195	HEAT TREATERS, ANNEALERS, ETC	50060150	241
196	FORGE AND HAMMER OPERATORS	50060200	237
197	JOB AND DIE SETTERS, METAL	50060250	245
198	MACHINISTS AND APPRENTICES	50060300	248-249
199	MILLWRIGHTS	50060400	267
200	MOLDERS, METAL AND APPRENTICES	50060450	268-269
201	PATTERN AND MODEL MAKERS	50060550	275
202	ROLLERS AND FINISHERS, METAL	50060600	285
203	SHEET METAL WORKERS AND APPRENTICES	50060650	287-288
204	TOOL AND DIEMAKERS AND APPRENTICES	50060750	299-300
	MECHANICS, REPAIRERS, INSTALLERS	50080000	
205	AIR COND, HEATING, REFRIG	50080050	250
206	AIRCRAFT MECHANICS AND REPAIRERS	50080100	251
207	AUTO ACCESSORIES INSTALLERS	50080150	211
208	AUTO BODY REPAIRERS	50080200	252
209	AUTO MECHANICS AND APPRENTICES	50080250	253-254
210	DATA PROCESSING MACH REPAIRERS	50080350	255
211	FARM IMPLEMENT MECH AND REPAIRERS	50080400	256
212	HEAVY EQUIP MECH, INCL DIESEL	50080450	257
213	HOUSEHOLD APPLIANCE MECHANICS	50080500	258
214	LOOM FIXERS	50080550	259
215	OFFICE MACHINE REPAIRERS	50080600	260
216	RADIO, TELEVISION REPAIRERS	50080650	261
217	RAILROAD, CAR SHOP REPAIRERS	50080700	262
218	OTHER MECHANICS AND APPRENTICES	50080750	263-264
	PRINTING TRADE CRAFTS WORKERS	50100000	
219	BOOKBINDERS	50100050	215
220	COMPOSITORS AND TYPESETTERS	50100100	224
221	ELECTROTYPERS, STEREOTYPERS	50100150	232
222	ENGRAVERS EXC PHOTOENGRAVERS	50100200	233

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TABLE A2 (CONTINUED)

377 OCCUPATIONAL CLASSIFICATION CATEGORIES

377 SEQ	OCCUPATION TITLE	MATRIX CODE	CEN SEQ
223	PHOTOENGRAVERS, LITHOGRAPHERS	50100250	276
224	PRINTING PRESS OPERATORS AND APPR	50100300	283-284
	TRANSPORTATION, PUB UTIL CRAFT	50120000	
225	ELEC POWR LINE INSTALL AND REPAIR	50120050	231
226	LOCOMOTIVE ENGINEERS	50120100	246
227	LOCOMOTIVE ENGINEER HELPERS	50120150	247
228	POWER STATION OPERATORS	50120200	282
229	TELEPHONE INSTALLERS, REPAIRERS	50120250	296
230	TELEPHONE LINE INSTALL AND REPAIR	50120300	297
	OTHER CRAFTS,KINDRED WORKERS	50140000	
231	BAKERS	50140050	212
232	CABINETMAKERS	50140100	219
233	CARPET INSTALLERS	50140150	222
234	CRANE, DERRICK, HOIST OPERATORS	50140200	226
235	DECORATORS, WINDOW DRESSERS	50140250	227
236	DENTAL LABORATORY TECH	50140300	228
237	FURNITURE AND WOOD FINISH	50140350	238
238	FURRIERS	50140400	239
239	GLAZIERS	50140450	240
240	INSPECTORS, LOG AND LUMBER	50140500	242
241	INSPECTORS, OTHER	50140550	243
242	JEWELERS AND WATCHMAKERS	50140600	244
243	MILLERS, GRAIN, FLOUR, SEED	50140650	266
244	MOTION PICTURE PROJECTIONISTS	50140700	270
245	OPTICIANS, LENS GRINDER, POLISHER	50140750	271
246	PIANO, ORGAN TUNERS, REPAIRERS	50140800	277
247	SHIPFITTERS	50140850	289
248	SHOE REPAIRERS	50140900	290
249	SIGN PAINTERS AND LETTERERS	50140950	291
250	STATIONARY ENGINEERS	50141000	292
251	STONE CUTTERS, STONE CARVERS	50141050	293
252	TAILORS	50141100	295
253	UPHOLSTERERS	50141150	301
254	CRAFT AND KINDRED WORKERS, NEC	50141200	225,302, 304
	OPERATIVES	60000000	
	OPERATIVES, EXC TRANSPORT	61000000	
	SEMISKILLED METALWORKING	61020000	
255	DRILL PRESS OPERATIVES	61020050	337
256	FURNACE TENDERS, SMELTERS, POURERS	61020100	320
257	GRINDING MACHINE OPERATIVES	61020150	338
258	HEATERS, METAL	61020200	324
259	LATHE, MILLING MACH OPERATIVES	61020250	339
260	METAL PLATERS	61020300	329
261	OTHER PRECISION MACH OPR	61020350	340
262	PUNCH STAMPING PRESS OPR	61020400	341
263	SOLDERERS	61020450	347
264	WELDERS AND FLAME CUTTERS	61020500	354
	SEMISKILLED TEXTILE	61040000	
265	CARDING, LAPPING, COMBING	61040050	349

TABLE A2 (CONTINUED)

377 OCCUPATIONAL CLASSIFICATION CATEGORIES

377 SEQ	OCCUPATION TITLE	MATRIX CODE	CEN SEQ
266	KNITTERS, LOOPERS, AND TOPPERS	61040100	350
267	SPINNERS, TWISTERS, WINDERS	61040150	351
268	WEAVERS	61040200	352
269	OTHER TEXTILE OPERATIVES	61040250	353
	SEMISKILLED PACKING, INSPECTING	61060000	
270	CHECKERS, EXAMINERS, ETC, MFG	61060050	312
271	GRADERS AND SORTERS, MFG	61060100	322
272	MEAT WRAPPERS, RETAIL TRADE	61060150	328
273	PACKER, WRAPPER, EX MEAT, PRODUCE	61060200	334
274	PROD GRDR, PACKER, EXC FACT, FARM	61060250	323
	OTHER OPERATIVES, EXC TRANSPORT	61080000	
275	ASBESTOS, INSULATION WORKERS	61080050	307
276	ASSEMBLERS	61080100	308
277	BLASTERS	61080150	309
278	BOTTLING, CANNING OPERATIVES	61080200	310
279	SURVEY HELPERS	61080250	311
280	CLOTHING IRONERS AND PRESSERS	61080300	313
281	CUTTING OPERATIVES, NEC	61080350	314
282	DRESSMAKERS,EXC FACTORY	61080400	315
283	DRILLERS, EARTH	61080450	316
284	DRY WALL INSTALLERS, LATHES	61080500	317
285	DYERS	61080550	318
286	FILER, POLISHER, SANDER, BUFFER	61080600	319
287	GARAGE WORKERS, GAS STAT ATTEN	61080650	321
288	LAUNDRY, DRY CLEAN OP, NEC	61080700	325
289	MEAT CUTTERS, BUTCHERS, EXC MFG	61080750	326
290	MEAT CUTTERS, BUTCHERS	61080800	327
291	MILLINERS	61080850	330
292	MINE OPERATIVES, NEC	61080900	331
293	MIXING OPERATIVES	61080950	332
294	OILERS, GREASERS, EXC AUTO	61081000	333
295	PAINTERS, MFG ARTICLES	61081050	335
296	PHOTOGRAPHIC PROCESS WORKERS	61081100	336
297	RIVETERS AND FASTENERS	61081150	342
298	SAILORS AND DECKHANDS	61081200	343
299	SAWYERS	61081250	344
300	SEWERS AND STITCHERS	61081300	345
301	SHOEMAKING MACHINE OPR	61081350	346
302	FURNACE TENDERS, STOKERS, EXC METAL	61081400	348
303	WINDING OPERATIVES, NEC	61081450	355
304	MISC MACH OPERATIVES	61081500	356
305	OPERATIVES, NEC	61081550	358
	TRANSPORT EQUIPMENT OPERATIVES	62000000	
306	BOAT OPERATORS	62000050	361
307	BUS DRIVERS	62000100	362
308	CONDUCTORS AND OPERATORS, URBAN RAIL	62000150	363
309	DELIVERY AND ROUTE WORKERS	62000200	364
310	FORK LIFT, TOW MOTOR OPR	62000250	365
311	RAIL VEHICLE OPERATORS,NEC	62000300	366
312	PARKING ATTENDANTS	62000350	367

TABLE A2 (CONTINUED)

377 OCCUPATIONAL CLASSIFICATION CATEGORIES

377 SEQ	OCCUPATION TITLE	MATRIX CODE	CEN SEQ
313	RAILROAD BRAKE OPERATORS, COUPLERS	62000400	368
314	RAILROAD SWITCH OPERATORS	62000450	369
315	TAXICAB DRIVERS, CHAUFFEURS	62000500	370
316	TRUCK DRIVERS	62000550	371
	SERVICE WORKERS	70000000	
	CLEANING SERVICE WORKERS	70020000	
317	LODGING QTRS CLEANERS, EXC PRIV	70020050	397
318	BUILDING INTERIOR CLEANERS, NEC	70020100	398
319	JANITORS AND SEXTONS	70020150	399
	FOOD SERVICE WORKERS	70040000	
320	BARTENDERS	70040050	400
321	WAITERS ASSISTANTS	70040100	401
322	COOKS, EXC PRIVATE	70040150	402
323	DISHWASHERS	70040200	403
324	FOOD COUNTER, FOUNTAIN WORKERS	70040250	404
325	WAITERS	70040300	405
326	FOOD WORKERS, NEC, EXC PRIVATE	70040350	406
	HEALTH SERVICE WORKERS	70060000	
327	DENTAL ASSISTANTS	70060050	407
328	HEALTH AIDES, EXCEPT NURSING	70060100	408
329	HEALTH TRAINEES	70060150	409
330	LAY MIDWIVES	70060200	410
331	NURSES AIDES, ORDERLIES	70060250	411
332	PRACTICAL NURSES	70060300	412
	PERSONAL SERVICE WORKERS	70080000	
333	FLIGHT ATTENDANTS	70080050	413
334	ATTEN, RECREATION, AMUSEMENT	70080100	414
335	ATTEN, PERSONAL SERVICE, NEC	70080150	415
336	BAGGAGE PORTERS AND BELLHOPS	70080200	416
337	BARBERS	70080250	417
338	BOARDING, LODGING HOUSEKEEPERS	70080300	418
339	BOOTBLACKS	70080350	419
340	CHILD CARE WORKERS, EXC PRIVATE	70080400	420
341	ELEVATOR OPERATORS	70080450	421
342	HAIRDRESSERS, COSMETOLOGISTS	70080500	422
343	HOUSEKEEPERS, EXC PRIVATE	70080550	424
344	SCHOOL MONITORS	70080650	425
345	USHERS, RECREATION, AMUSEMENT	70080700	426
346	WELFARE SERVICE AIDES	70080750	427
	PROTECTIVE SERVICE WORKERS	70100000	
347	CROSSING GUARD, BRIDGETENDERS	70100050	428
348	FIRE FIGHTERS	70100100	429
349	GUARDS	70100150	430
350	MARSHALS AND CONSTABLES	70100200	431
351	POLICE AND DETECTIVES	70100250	432
352	SHERIFFS AND BAILIFFS	70100300	433
	PRIVATE HOUSEHOLD WORKERS	70120000	
353	CHILD CARE WORKERS	70120050	435
354	COOKS, PRIVATE	70120100	436
355	HOUSEKEEPERS, PRIVATE	70120150	437

TABLE A2 (CONTINUED)

377 OCCUPATIONAL CLASSIFICATION CATEGORIES

377 SEQ	OCCUPATION TITLE	MATRIX CODE	CEN SEQ
356	LAUNDERERS, PRIVATE	70120200	438
357	CLEANERS AND SERVANTS, PRIVATE	70120250	439
	LABORERS, EXCEPT FARM	80000000	
358	ANIMAL CARETAKERS, EXC FARM	80000050	373
359	CARPENTERS, HELPERS	80000100	374
360	CONSTR LABR, EXC CARPENTER HELP	80000150	375
361	FISHERS, HUNTERS AND TRAPPERS	80000200	376
362	FREIGHT, MATERIAL HANDLERS	80000250	377
363	GARBAGE COLLECTORS	80000300	378
364	GARDENERS, GROUNDKEEPER, EXC FARM	80000350	379
365	LONGSHORE WORKERS AND STEVEDORES	80000400	380
366	TIMBER CUTTING AND LOGGING WORKERS	80000450	381
367	STOCK HANDLERS	80000500	382
368	TEAMSTERS	80000550	383
369	VEHICLE WASHER, EQUIP CLEANERS	80000600	384
370	WAREHOUSE LABORERS, NEC	80000650	385
371	OTHER LABORERS	80000700	386
	FARMERS AND FARM WORKERS	90000000	
	FARMERS AND FARM MANAGERS	90020000	
372	FARMERS OWNERS AND TENANTS	90020050	389
373	FARM MANAGERS	90020100	390
	FARM LABORERS, FARM SUPERVISORS	90040000	
374	FARM LABOR SUPERVISORS	90040050	392
375	FARM LABORERS, WAGE WORKERS	90040100	393
376	FARM LABORERS, UNPAID FAMILY	90040150	394
377	FARM LABORERS, SELF-EMPL	90040200	395

Note: Matrix codes refer to BLS employment matrix as adapted for JOF use by Employment Security. The 377 sequential codes count the detailed categories that appear on the HRPI version of the matrix. The census sequential codes refer to corresponding categories from the 1970 Manpower tallies. See Technical Report on JOF II.

TABLE A3

SAMPLE INDUSTRY DETAIL FOR OE CODING

	Name	Matrix Codes	SIC codes (approximate)
1.	Agriculture	001	01
2.	Horticulture	002, 003	07
3.	Forestry	004	08
4.	Fisheries	005	09
5.	Mining	006	10-14
6.	General Building	007	15
7.	Contractors	008	16
8.	Special Trades	009	17
9.	Lumber and Wood	010-012	24
10.	Furniture	013	25
11.	Stone, Clay, Glass	014-018	32
12.	Primary Metal	019-021	33
13.	Fabricated Metal	022-026	34
14.	Machinery, ex. elec.	027-033	35
15.	Electrical Equipment	034-036	36
16.	Aircraft and parts	038	372
17.	Shipbuilding	039	373
18.	Misc. Trans. Equipment	037, 040	371, 374, 375, 379
19.	Misc. Durables	041	19, 38, 39
20.	Food Products	042-049	20
21.	Apparel	052-053	23
22.	Pulp and Paper	054-055	26
23.	Publishing and Printing	056-057	27

TABLE A3 (CONTINUED)

SAMPLE INDUSTRY DETAIL FOR OE CODING

Name	Matrix Codes	SIC codes (approximate)
24. Chemicals	058-065	28
25. Petroleum Products	066-067	29
26. Misc. Non Durables	050-051, 068-071	21, 22, 30, 31
27. Bus & Taxi Transportation	073-074	411-415, 417
28. Trucking and Warehouse	075-076	421, 422, 425
29. Air Transportation	078	45
30. Other Transportation	072, 077, 079-080	40, 44, 46, 47
31. Telephone and Telegraph	081-082	481, 482, 489
32. Radio and TV	083	483
33. Utilities	084-087	491, 492, 493, 494, 496
34. Sanitation and Other	088-089	495, 497
35. Vehicles, Parts, and Service	090, 116-119	501, 55
36. Lumber, Hardware, and Parts	095-097, 103, 105, 106	506, 507, 508, 5098, 521, 522, 523, 524, 525
37. Food Stores	093-094, 112-115	504, 505, 541
38. Eating and Drinking	124	58
39. Consumer Goods	092, 101 120-123 125-130	5094, 5095, 56. 57, 591, 592, 596, 597, 598, 5992
40. Other Wholesale & Retail	091, 104, 098-100 102, 107-111, 131	502, 5091, 5092, 5093, 5096, 5094, 5097, 5099, 53, 593, 594, 595, 599, exc. 5592

TABLE A3 (CONTINUED)

SAMPLE INDUSTRY DETAIL FOR OE CODING

Name	Matrix Codes	SIC codes (approximate)
41. Finance	132-134	60, 61, 62, 67
42. Insurance	135	63, 64
43. Real Estate	136	65, 66
44. Hotel and Lodging	137-138, 177	70
45. Business, Technical, Legal	145-151, 152, 167, 178-180	73, 81, 867, 892, 899
46. Auto and Misc. Repair	153-156	734, 75, 76
47. Entertainment	157-159	78, 79
48. Medical and Technical	160-166	7391, 7397, 80
49. Education and Welfare	168-172, 174-175	82, 84
50. Misc. Services	139-144, 173, 176	72, 866, 861
51. Federal Public Admin.	181-182	91, 949
52. State and Local Public. Administration	183-184	92, 93

TABLE A4

SAMPLE WORKSHEET FOR CODING INDUSTRY ASSIGNMENTS

AND COEFFICIENT ALLOCATIONS

ASSIGNMENTS FOR
MATRIX OCCUPATION:

OE-Code	OE-Name	Allocation Coefficient	Agriculture	Mining	Construc-tion	Manufactur-ing	Transporta-tion	Communica-tions	Utilities	Trade	Finance	Insurance	Real Estate	Services	Government	All Industries

Note: This sample worksheet is for a highly aggregated set of industry categories. In practice it may be necessary to disaggregate these categories to a level appropriate to the industry assignment needs of the vocational education programs in a specific region. An example of such a disaggregated industry list is given in Table A4.

BIBLIOGRAPHY

California Employment Development Department, U.S.O.E. - D.O.T. - Census Cross Reference, Occupational Code Conversion System, April 1976.

Human Resources Planning Institute, Manpower Analysis: Role in Post Secondary Education Planning, unpublished paper presented by Theodore Lane and Marc Reeder to the 12th Annual Conference of the Society for College and University Planning, August 6, 1977, Seattle, Washinton.

Human Resources Planning Institute. "Occupational Training Demand Forecast Technical Memo." Prepared for Coordinating Council for Occupational Education. Seattle, Washington, December 1973.

Massachusetts Division of Employment Security, Meeting State and Area Occupational Information Needs: The Industry Occupational Matrix System, Ruth E. Rowan, July 1976.

United States:

Department of Commerce, Bureau of the Census. Census of Population: 1970. Volume I, Characteristics of the Population. Washington D.C.: U.S. Government Printing Office, 1973.

Department of Commerce, Bureau of the Census. Census of Population: 1970. Classification Index of Industries and Occupations. Washington, D.C.: U.S. Government Printing Office.

Department of Commerce, Bureau of the Census. "1970 Census of Population and Housing Special Project." Description, content and arrangement of the manpower tallies from the 1970 Census Special Project for the Manpower Administration. Photocopied. May 1974.

Department of Health, Education, and Welfare, Office of Education. Vocational Education and Occupations. Washington, D.C.: U.S. Government Printing Office, 1969.

Department of Labor, Bureau of Labor Statistics. "Conversion of Occupational Titles in BLS National Matrix to Vocational Education Classification System." Preliminary version for 1970 census codes. Photocopied; date unknown.

Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, January 1977. Occupational Mobility in the American Labor Force, by Dixie Summers and Allan Eck.

Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, March 1976, Revised BLS projection to 1980 and 1885: an overview, by Ronald E. Kutscher.

Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, November 1976, Several articles on Revised BLS industry and occupational employment projections for the nation.

Department of Labor, Bureau of Labor Statistics. Tomorrow's Manpower Needs. Volume I, Developing Area Manpower Projections. Bulletin No. 1606. Washington, D.C.: U.S. Government Printing Office, February 1969.

Department of Labor, Bureau of Labor Statistics. Tomorrow's Manpower Needs. Volume II, National Trends and Outlook: Industry Employment and Occupational Structure. Bulletin No. 1606. Washington, D.C.: U.S. Government Printing Office, February 1969.

Department of Labor, Bureau of Labor Statistics. Tomorrow's Manpower Needs. Volume III, National Trends and Outlook: Occupational Employment. Bulletin No. 1606. Washington, D.C.: U.S. Government Printing Office, February 1969.

Department of Labor, Bureau of Labor Statistics. Tomorrow's Manpower Needs. Volume IV, The National Industry-Occupational Matrix and Other Manpower Data. Bulletin No. 1606. Washington, D.C.: U.S. Government Printing Office, February 1969.

Washington State Commission for Vocational Education, Job Opportunities Forecast 2nd Edition, September 1975.

APPENDIX B

TABLES SUPPORTING THE ADAPTATION OF THE
OCCUPATIONAL EDUCATION FORECASTING SYSTEM
TO WASHINGTON STATE

APPENDIX

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MAP 1

01.01.00 AGRICULTURAL PRODUCTION					
OCCUPATION:	023 AGRI, BIOLOG TECH EXC HEALTH	(10080050)	COEF= .200	INDUSTRIES:	001-184
	088 FARM MANAGEMENT ADVISORS	(10240300)	.300		001-184
	089 FORESTERS, CONSERVATIONISTS	(10240350)	.100		001-184
	102 BUYERS, SHIPPERS, FARM PROD	(20020150)	.500		001-003
	211 FARM IMPLEMENT MECH AND REPAIRERS	(50080400)	.100		001-184
	218 OTHER MECHANICS AND APPRENTICES	(50080750)	.100		001-037,040-077,079-184
	243 MILLERS, GRAIN, FLOUR, SEED	(50140650)	.500		001-184
	372 FARMERS OWNERS AND TENANTS	(90020050)	.600		001-184
	373 FARM MANAGERS	(90020100)	.500		001-184
	374 FARM LABOR SUPERVISORS	(90040050)	.400		001-184
	375 FARM LABORERS, WAGE WORKERS	(90040100)	.600		001-184
	376 FARM LABORERS, UNPAID FAMILY	(90040150)	.600		001-184
	377 FARM LABORERS, SELF-EMPL	(90040200)	.300		001-184
01.02.00 AGRICULTURAL BUSINESS					
OCCUPATION:	088 FARM MANAGEMENT ADVISORS	(10240300)	COEF= .300	INDUSTRIES:	001-184
	089 FORESTERS, CONSERVATIONISTS	(10240350)	.100		001-184
	102 BUYERS, SHIPPERS, FARM PROD	(20020150)	.500		001-003
	103 BUYERS, WHOLESALE, RETAIL	(20020200)	.100		001-111,116-184
	104 PURCHASING AGENTS, BUYERS, NEC	(20020250)	.200		001-184
	105 SALES MANAGER, RETAIL TRADE	(20020300)	1.000		001-005

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MAP 2

01.02.00 (CONTINUED)

OCCUPATION:	106 SALES MANAGER, EXC RET TRADE	(20020350)	COEF= 1.000	INDUSTRIES:	001-005
	110 INSPECTORS, EXC CONSTRUCT PUB	(20040200)	.300		001-184
	122 OTHER MGRS, ADMINISTRATORS	(20060400)	.200		001-092,095-111,116-146,148-159,167-184
	131 SALES WORKERS,NEC	(30000450)	1.000		042-045,064
	131 SALES WORKERS,NEC	(30000450)	.900		001-003,028,031,127,130
	211 FARM IMPLEMENT MECH AND REPAIRERS	(50080400)	.100		001-184
	243 MILLERS, GRAIN, FLOUR, SEED	(50140650)	.500		001-184
	273 PACKER, WRAPPER, EX MEAT, PRODUCE	(61060200)	1.000		001-184
	274 PROD GRDR, PACKER, EXC FACT, FARM	(61060250)	1.000		001-184
	289 MEAT CUTTERS, BUTCHERS, EXC MFG	(61080750)	.200		001-184
	358 ANIMAL CARETAKERS, EXC FARM	(80000050)	.100		001-184
	364 GARDENERS, GROUNDKEEPER, EXC FARM	(80000350)	.100		001-184
	372 FARMERS OWNERS AND TENANTS	(90020050)	.200		001-184
	373 FARM MANAGERS	(90020100)	.200		001-184
	374 FARM LABOR SUPERVISORS	(90040050)	.200		001-184
	375 FARM LABORERS, WAGE WORKERS	(90040100)	.400		001-184
	376 FARM LABORERS, UNPAID FAMILY	(90040150)	.200		001-184
	377 FARM LABORERS, SELF-EMPL	(90040200)	.100		001-184

01.02.98 ANIMAL TECHNOLOGY
(BASED ON THE NUMBER OF VETERINARIANS)

OCCUPATION:	023 AGRI, BIOLOG TECH EXC HEALTH	(10080050)	COEF= .200	INDUSTRIES:	001-184

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01.02.98	(CONTINUED)					
	OCCUPATION: 041 VETERINARIANS	(10100500)	COEF= 1.000	INDUSTRIES:	001-184	
	358 ANIMAL CARETAKERS, EXC FARM	(80000050)	.600		001-184	
01.02.99	FARRIER					
	OCCUPATION: 023 AGRI, BIOLOG TECH EXC HEALTH	(10080050)	COEF= .200	INDUSTRIES:	001-184	
	193 BLACKSMITHS	(50060050)	1.000		001-005	
	254 CRAFT AND KINDRED WORKERS, NEC	(50141200)	.100		001-184	
	358 ANIMAL CARETAKERS, EXC FARM	(80000050)	.100		001-184	
	377 FARM LABORERS, SELF-EMPL	(90040200)	.300		001-184	
01.03.01	AGRICULTURAL MECHANICS					
	OCCUPATION: 211 FARM IMPLEMENT MECH AND REPAIRERS	(50080400)	COEF= .600	INDUSTRIES:	001-184	
	212 HEAVY EQUIP MECH, INCL DIESEL	(50080450)	1.000		001-005	
	218 OTHER MECHANICS AND APPRENTICES	(50080750)	.200		001-037,040-077,079-184	
	372 FARMERS OWNERS AND TENANTS	(90020050)	.200		001-184	
	373 FARM MANAGERS	(90020100)	.200		001-184	
	374 FARM LABOR SUPERVISORS	(90040050)	.400		001-184	
	377 FARM LABORERS, SELF-EMPL	(90040200)	.300		001-184	
01.03.04	IRRIGATION TECHNOLOGY					
	OCCUPATION: 088 FARM MANAGEMENT ADVISORS	(10240300)	COEF= .200	INDUSTRIES:	001-184	
	089 FORESTERS, CONSERVATIONISTS	(10240350)	.100		001-184	

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MAP 4

01.03.04	(CONTINUED)					
	OCCUPATION:	131 SALES WORKERS,NEC	(30000450)	COEF= .100	INDUSTRIES:	001-003,028,031,127, 130
		211 FARM IMPLEMENT MECH AND REPAIRERS	(50080400)	.200		001-184
		283 DRILLERS, EARTH	(61080450)	.400		001-184
01.05.00	ENVIRONMENTAL HORTICULTURE					
	OCCUPATION:	364 GARDENERS, GROUNDKEEPER, EXC FARM	(80000350)	COEF= .600	INDUSTRIES:	001-184
01.06.00	NATURAL RESOURCES					
	OCCUPATION:	023 AGRI, BIOLOG TECH EXC HEALTH	(10080050)	COEF= .200	INDUSTRIES:	001-184
		088 FARM MANAGEMENT ADVISORS	(10240300)	.200		001-184
		089 FORESTERS, CONSERVATIONISTS	(10240350)	.100		001-184
		096 RESEARCH WORKERS, NEC	(10240700)	1.000		001-008,010-012,042-047,054-055
		097 RECREATION WORKERS	(10240750)	.300		001-071,084-089
		361 FISHERS, HUNTERS AND TRAPPERS	(80000200)	.300		001-184
		364 GARDENERS, GROUNDKEEPER, EXC FARM	(80000350)	.300		001-184
01.06.02	RECREATION TECHNOLOGY					
	OCCUPATION:	089 FORESTERS, CONSERVATIONISTS	(10240350)	COEF= .200	INDUSTRIES:	001-184
		097 RECREATION WORKERS	(10240750)	.400		001-071,084-089
		334 ATTEN, RECREATION, AMUSEMENT	(70080100)	.200		001-184
01.06.04	FISH AND GAME MANAGEMENT					
	OCCUPATION:	089 FORESTERS, CONSERVATIONISTS	(10240350)	COEF= .200	INDUSTRIES:	001-184

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MAP 5

01.06.04 (CONTINUED)

OCCUPATION:	097 RECREATION WORKERS	(10240750)	COEF= .300	INDUSTRIES:	001-071,084-089
	358 ANIMAL CARETAKERS, EXC FARM	(80000050)	.200		001-184
	361 FISHERS, HUNTERS AND TRAPPERS	(80000200)	.400		001-184

01.07.00 INDUSTRIAL FORESTRY
ALSO SEE 16.06.03 FORESTRY TECHNOLOGY

OCCUPATION:	366 TIMBER CUTTING AND LOGGING WORKERS	(80000450)	COEF= 1.000	INDUSTRIES:	001-184
	371 OTHER LABORERS	(80000700)	1.000		004,010-012

04.01.00 DISPLAY DESIGNING

OCCUPATION:	075 DESIGNERS	(10220250)	COEF= .300	INDUSTRIES:	001-184
	105 SALES MANAGER, RETAIL TRADE	(20020300)	1.000		145-146,148-150,152, 167,178-180
	123 ADVERTISING AGENTS, SALES WORKERS	(30000050)	.200		001-184
	235 DECORATORS, WINDOW DRESSERS	(50140250)	.600		001-184

04.02.00 FASHION MERCHANDISING

OCCUPATION:	075 DESIGNERS	(10220250)	COEF= .200	INDUSTRIES:	001-184
	123 ADVERTISING AGENTS, SALES WORKERS	(30000050)	.300		001-184
	125 DEMONSTRATORS	(30000150)	1.000		052-053,091-092,098-102,104,107-111,120-123,125-131,145-146
	125 DEMONSTRATORS	(30000150)	1.000		148-150,152,167,178-180
	131 SALES WORKERS,NEC	(30000450)	.300		004-010,013-027,029-030,032-036,038-041, 046-063,065-067,

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MAP 6

04.02.00 (CONTINUED)					
OCCUPATION:	131 SALES WORKERS,NEC	(30000450)	COEF= .300	INDUSTRIES:	069-079,081-089,091-092,095,097-102,104,106-111,116,
	131 SALES WORKERS,NEC	(30000450)	.300		120-126,128-129,131-135,137-150,152,157-164
	151 COUNTER CLERKS, EXC FOOD	(40060400)	1.000		001-164
	177 MISC CLERICAL WORKERS, NEC	(40061700)	.300		001-134,137-164
04.03.00 PARTS MERCHANDISING					
OCCUPATION:	131 SALES WORKERS,NEC	(30000450)	COEF= 1.000	INDUSTRIES:	037,068,080,090,096,117-119,151,153-156
	170 STOCK CLERKS, STORE KEEPERS	(40061350)	.400		001-146,148-159,167-164
04.04.00 FINANCIAL MANAGEMENT					
OCCUPATION:	100 BANK, FINANCIAL MANAGERS	(20020050)	COEF= .400	INDUSTRIES:	001-164
	101 CREDIT MANAGERS	(20020100)	.500		001-164
	130 STOCK AND BOND SALES AGENTS	(30000400)	.500		001-164
	144 BANK TELLERS	(40060050)	.300		001-164
	147 CASHIERS	(40060200)	.500		001-089,137-164
	150 COLLECTORS, BILL AND ACCOUNT	(40060350)	.500		001-164
04.06.00 CASHIER/CHECKER NOT LIMITED TO FOOD DISTRIBUTION INCLUDES ALL RETAIL INDUSTRIES					
OCCUPATION:	105 SALES MANAGER, RETAIL TRADE	(20020300)	COEF= .400	INDUSTRIES:	093-094,112-115

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MAP 7

04.06.00	(CONTINUED)					
	OCCUPATION: 131 SALES WORKERS,NEC	(30000450)	COEF= .500	INDUSTRIES:	093-094,112-115	
	147 CASHIERS	(40060200)	1.000		090-131	
04.06.98	SUPERMARKET MANAGEMENT					
	OCCUPATION: 103 BUYERS, WHOLESALE, RETAIL	(20020200)	COEF= 1.000	INDUSTRIES:	112-115	
	105 SALES MANAGER, RETAIL TRADE	(20020300)	.600		093-094,112-115	
	122 OTHER MGRS, ADMINISTRATORS	(20060400)	1.000		093-094,112-115	
	131 SALES WORKERS,NEC	(30000450)	.500		093-094,112-115	
04.07.00	CLUB AND TAVERN MANAGEMENT ALSO SEE 17.25.02 COMMERCIAL COOKING					
	OCCUPATION: 121 RESTAURANT, CAFE, BAR MGRS	(20060350)	COEF= .300	INDUSTRIES:	001-184	
	320 BARTENDERS	(70040050)	.600		001-184	
04.08.00	MARKETING AND SALES					
	OCCUPATION: 010 ENGINEERS, SALES	(10020500)	COEF= .900	INDUSTRIES:	001-184	
	080 PUBLIC RELATIONS SPECIALISTS	(10220500)	.500		001-184	
	103 BUYERS, WHOLESALE, RETAIL	(20020200)	.500		001-111,116-184	
	104 PURCHASING AGENTS, BUYERS, NEC	(20020250)	.200		001-184	
	105 SALES MANAGER, RETAIL TRADE	(20020300)	.700		006-010,013-092,095-102,104,106-111,116-123,125-136,139-144	
	105 SALES MANAGER, RETAIL TRADE	(20020300)	.700		147,151,153-166,168-176,181-184	
	106 SALES MANAGER, EXC RET TRADE	(20020350)	.700		006-092,095-111,116-136,139-176,178-184	

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MAP 8

04.08.00	(CONTINUED)					
	OCCUPATION:	122 OTHER MGRS, ADMINISTRATORS	(20060400)	COEF= .500	INDUSTRIES:	001-092,095-111,116-146,148-159,167-184
		123 ADVERTISING AGENTS, SALES WORKERS	(30000050)	.200		001-184
		126 HUCKSTERS AND PEDDLERS	(30000200)	1.000		001-184
		131 SALES WORKERS,NEC	(30000450)	.500		004-010,013-027,029-030,032-036,038-041,046-063,065-067,
		131 SALES WORKERS,NEC	(30000450)	.500		069-079,081-089,091-092,095,097-102,104,106-111,116,
		131 SALES WORKERS,NEC	(30000450)	.500		120-126,128-129,131-135,137-150,152,157-184
04.09.00	FOREST PRODUCTS DISTRIBUTION					
	OCCUPATION:	105 SALES MANAGER, RETAIL TRADE	(20020300)	COEF= 1.000	INDUSTRIES:	011-012,103,105
		131 SALES WORKERS,NEC	(30000450)	1.000		011-012,103,105
04.10.00	INTERIOR MERCHANDISING					
	OCCUPATION:	075 DESIGNERS	(10220250)	COEF= .100	INDUSTRIES:	001-184
		090 HOME MANAGEMENT ADVISORS	(10240400)	1.000		090-131
		103 BUYERS, WHOLESALE, RETAIL	(20020200)	.200		001-111,116-184
		116 MGRS, SUPERINTENDENTS, BLDG	(20060100)	.100		001-184
		131 SALES WORKERS,NEC	(30000450)	.200		004-010,013-027,029-030,032-036,038-041,046-063,065-067,
		131 SALES WORKERS,NEC	(30000450)	.200		069-079,081-089,091-092,095,097-102,104,106-111,116,

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MAP 9

04.10.00	(CONTINUED)					
	OCCUPATION: 131 SALES WORKERS,NEC	(30000450)	COEF= .200	INDUSTRIES:	120-126,128-129,131-135,137-150,152,157-184	
	253 UPHOLSTERERS	(50141150)	.100		001-039,041-184	
	253 UPHOLSTERERS	(50141150)	.070		040	
04.11.00	HOTEL, MOTEL, RESTAURANT MANAGEMENT					
	OCCUPATION: 095 PERSONNEL LABOR RELATIONS	(10240650)	COEF= .200	INDUSTRIES:	001-184	
	105 SALES MANAGER, RETAIL TRADE	(20020300)	1.000		124,137-138,177	
	106 SALES MANAGER, EXC RET TRADE	(20020350)	1.000		093-094,112-115,137-138,177	
	116 MGRS, SUPERINTENDENTS, BLDG	(20060100)	.400		001-184	
	117 OFFICE MANAGERS, NEC	(20060150)	1.000		124,137-138,177	
	121 RESTAURANT, CAFE, BAR MGRS	(20060350)	.400		001-184	
	338 BOARDING, LODGING HOUSEKEEPERS	(70080300)	1.000		001-184	
	343 HOUSEKEEPERS, EXC PRIVATE	(70080550)	.400		001-184	
04.12.00	INSURANCE MANAGEMENT					
	OCCUPATION: 127 INSURANCE AGENTS, BROKERS, ETC	(30000250)	COEF= .500	INDUSTRIES:	001-184	
	157 INSURANCE ADJUST, EXAM	(40060700)	.500		001-184	
04.16.00	SERVICE STATION OPERATION AND MANAGEMENT					
	OCCUPATION: 207 AUTO ACCESSORIES INSTALLERS	(50080150)	COEF= .500	INDUSTRIES:	072-080,090,116-119,151,153-156	
	287 GARAGE WORKERS, GAS STAT ATTEN	(61080650)	1.000		001-184	

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MAP 10

04.16.00	(CONTINUED)					
	OCCUPATION:	369 VEHICLE WASHER, EQUIP CLEANERS	(80000600)	COEF= 1.000	INDUSTRIES:	001-184
04.17.00	REAL ESTATE					
	OCCUPATION:	107 ASSESS, CONTROL, LOC PUB ADMIN	(20040050)	COEF= .300	INDUSTRIES:	001-184
		116 MGRS, SUPERINTENDENTS, BLDG	(20060100)	.400		001-184
		127 INSURANCE AGENTS, BROKERS, ETC	(30000250)	.300		001-184
		129 REAL ESTATE AGENTS, BROKERS	(30000350)	1.000		001-184
		131 SALES WORKERS,NEC	(30000450)	1.000		136
		154 ESTIMATORS, INVESTIGATORS, NEC	(40060550)	1.000		136
		166 REAL ESTATE APPRAISERS	(40061150)	1.000		001-184
04.18.00	COMMERCIAL RECREATION AND TOURISM					
	OCCUPATION:	097 RECREATION WORKERS	(10240750)	COEF= .600	INDUSTRIES:	072-084,090-184
		175 TICKET STATION, EXPRESS AGENTS	(40061600)	.500		001-184
		334 ATTEN, RECREATION, AMUSEMENT	(70080100)	.200		001-184
		345 USHERS, RECREATION, AMUSEMENT	(70080700)	.600		001-184
04.19.00	TRANSPORTATION					
	OCCUPATION:	118 OFFICERS, PILOTS, PURSERS, SHIP	(20060200)	COEF= .300	INDUSTRIES:	001-184
		175 TICKET STATION, EXPRESS AGENTS	(40061600)	.500		001-184
		307 BUS DRIVERS	(62000100)	.400		001-184
		309 DELIVERY AND ROUTE WORKERS	(62000200)	.400		001-184
		312 PARKING ATTENDANTS	(62000350)	1.000		001-184

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04.19.00	(CONTINUED)					
	OCCUPATION: 313	RAILROAD BRAKE OPERATORS, COUPLERS	(62000400)	COEF= 1.000	INDUSTRIES:	001-184
	314	RAILROAD SWITCH OPERATORS	(62000450)	1.000		001-184
	370	WAREHOUSE LABORERS, NEC	(80000650)	.400		001-184
04.19.01	MOTOR FREIGHT					
	OCCUPATION: 362	FREIGHT, MATERIAL HANDLERS	(80000250)	COEF= .400	INDUSTRIES:	001-184
04.19.02	AIR CARGO					
	OCCUPATION: 362	FREIGHT, MATERIAL HANDLERS	(80000250)	COEF= .200	INDUSTRIES:	001-184
04.19.03	TRANSPORTATION AGENT					
	OCCUPATION: 362	FREIGHT, MATERIAL HANDLERS	(80000250)	COEF= .400	INDUSTRIES:	001-184
04.19.98	FLIGHT ATTENDANT					
	OCCUPATION: 333	FLIGHT ATTENDANTS	(70080050)	COEF= 1.000	INDUSTRIES:	001-184
04.20.00	SERVICE REPRESENTATIVE					
	OCCUPATION: 167	RECEPTIONISTS	(40061200)	COEF= .500	INDUSTRIES:	001-146,148-156,167-184
	229	TELEPHONE INSTALLERS, REPAIRERS	(50120250)	.500		001-184
	270	CHECKERS, EXAMINERS, ETC, MFG	(61060050)	.300		001-184
	291	MILLINERS	(61080850)	.400		001-184
	345	USHERS, RECREATION, AMUSEMENT	(70080700)	.400		001-184
04.99.00	PURCHASING MANAGEMENT					
	OCCUPATION: 010	ENGINEERS, SALES	(10020500)	COEF= .100	INDUSTRIES:	001-184

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MAP 12

04.99.00	(CONTINUED)					
	OCCUPATION:	102 BUYERS, SHIPPERS, FARM PROD	(20020150)	COEF= 1.000	INDUSTRIES:	006-184
		103 BUYERS, WHOLESALE, RETAIL	(20020200)	.200		001-111,116-184
		104 PURCHASING AGENTS, BUYERS, NEC	(20020250)	.400		001-184
		117 OFFICE MANAGERS, NEC	(20060150)	.300		001-123,125-136,139-176,178-184
		122 OTHER MGRS, ADMINISTRATORS	(20060400)	.100		001-092,095-111,116-146,148-159,167-184
		270 CHECKERS, EXAMINERS, ETC, MFG	(61060050)	.300		001-184
07.01.01	DENTAL ASSISTING					
	OCCUPATION:	167 RECEPTIONISTS	(40061200)	COEF= .400	INDUSTRIES:	147,160-166
		327 DENTAL ASSISTANTS	(70060050)	1.000		001-184
07.01.02	DENTAL HYGIENE					
	OCCUPATION:	044 DENTAL HYGIENISTS	(10120100)	COEF= 1.000	INDUSTRIES:	001-184
07.01.03	DENTAL LABORATORY TECHNOLOGY					
	OCCUPATION:	236 DENTAL LABORATORY TECH	(50140300)	COEF= 1.000	INDUSTRIES:	001-184
07.02.00	MEDICAL LABORATORY TECHNOLOGY					
	OCCUPATION:	043 CLINICAL LAB TECHNOL, TECH	(10120050)	COEF= .200	INDUSTRIES:	001-184
		096 RESEARCH WORKERS, NEC	(10240700)	1.000		147,160-166
07.02.03	LABORATORY TECHNOLOGY					
	OCCUPATION:	048 OTHER HEALTH TECHNOL, TECH	(10120300)	COEF= .100	INDUSTRIES:	001-184

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07.03.01	REGISTERED/ASSOCIATE DEGREE NURSING					
	OCCUPATION: 039 REGISTERED NURSES	(10100400)	COEF= 1.000	INDUSTRIES:	001-184	
07.03.02	PRACTICAL NURSING					
	OCCUPATION: 332 PRACTICAL NURSES	(70060300)	COEF= 1.000	INDUSTRIES:	001-184	
	335 ATTEN, PERSONAL SERVICE, NEC	(70080150)	.200		001-184	
	340 CHILD CARE WORKERS, EXC PRIVATE	(70080400)	.200		001-184	
07.03.03	NURSES AIDE/NURSING ASSISTING					
	OCCUPATION: 048 OTHER HEALTH TECHNOL, TECH	(10120300)	COEF= .400	INDUSTRIES:	001-184	
	331 NURSES AIDES, ORDERLIES	(70060250)	.600		001-184	
07.03.05	SURGICAL TECHNOLOGY					
	OCCUPATION: 048 OTHER HEALTH TECHNOL, TECH	(10120300)	COEF= .500	INDUSTRIES:	001-184	
07.03.07	HOME HEALTH AIDE					
	OCCUPATION: 328 HEALTH AIDES, EXCEPT NURSING	(70060100)	COEF= .200	INDUSTRIES:	001-184	
	335 ATTEN, PERSONAL SERVICE, NEC	(70080150)	.200		001-184	
	353 CHILD CARE WORKERS	(70120050)	.300		001-184	
	354 COOKS, PRIVATE	(70120100)	.300		001-184	
	355 HOUSEKEEPERS, PRIVATE	(70120150)	.500		001-184	
	356 LAUNDERERS, PRIVATE	(70120200)	.500		001-184	
07.03.99	GERONTOLOGY AIDE					
	OCCUPATION: 331 NURSES AIDES, ORDERLIES	(70060250)	COEF= .400	INDUSTRIES:	001-184	

07.03.99	(CONTINUED)					
	OCCUPATION: 335 ATTEN, PERSONAL SERVICE, NEC	(70080150)	COEF=	.200	INDUSTRIES:	001-184
	346 WELFARE SERVICE AIDES	(70080750)		.300		001-184
	354 COOKS, PRIVATE	(70120100)		.300		001-184
	355 HOUSEKEEPERS, PRIVATE	(70120150)		.500		001-184
	356 LAUNDERERS, PRIVATE	(70120200)		.500		001-184
07.04.01	OCCUPATIONAL THERAPY ASSISTING					
	OCCUPATION: 334 ATTEN, RECREATION, AMUSEMENT	(70080100)	COEF=	.200	INDUSTRIES:	001-184
07.04.02	PHYSICAL THERAPY ASSISTING					
	OCCUPATION: 040 THERAPISTS	(10100450)	COEF=	.200	INDUSTRIES:	001-184
	047 THERAPY ASSISTANTS	(10120250)		1.000		001-184
07.04.99	SPORTS TRAINING ASSISTING					
	OCCUPATION: 328 HEALTH AIDES, EXCEPT NURSING	(70060100)	COEF=	.100	INDUSTRIES:	001-184
	329 HEALTH TRAINEES	(70060150)		.400		001-184
	334 ATTEN, RECREATION, AMUSEMENT	(70080100)		.100		001-184
07.05.01	RADIOLOGIC TECHNOLOGY					
	OCCUPATION: 043 CLINICAL LAB TECHNOL, TECH	(10120050)	COEF=	.200	INDUSTRIES:	001-184
	046 RADIOLOGIC TECHNOL, TECH	(10120200)		.700		001-184
07.05.03	NUCLEAR MEDICAL TECHNOLOGY					
	OCCUPATION: 043 CLINICAL LAB TECHNOL, TECH	(10120050)	COEF=	.200	INDUSTRIES:	001-184

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07.05.03	(CONTINUED)					
	OCCUPATION: 046 RADIOLOGIC TECHNOL, TECH	(10120200)	COEF= .100	INDUSTRIES:	001-184	
07.06.00	OPTOMETRIC TECHNOLOGY					
	OCCUPATION: 245 OPTICIANS, LENS GRINDER, POLISHER	(50140750)	COEF= 1.000	INDUSTRIES:	001-184	
07.08.01	MENTAL HEALTH TECHNOLOGY					
	OCCUPATION: 335 ATTEN, PERSONAL SERVICE, NEC	(70080150)	COEF= .200	INDUSTRIES:	001-184	
07.08.02	MENTAL RETARDATION TECHNOLOGY					
	OCCUPATION: 328 HEALTH AIDES, EXCEPT NURSING	(70060100)	COEF= .100	INDUSTRIES:	001-184	
	334 ATTEN, RECREATION, AMUSEMENT	(70080100)	.200		001-184	
	335 ATTEN, PERSONAL SERVICE, NEC	(70080150)	.200		001-184	
	340 CHILD CARE WORKERS, EXC PRIVATE	(70080400)	.200		001-184	
07.09.03	RESPIRATORY THERAPY					
	OCCUPATION: 043 CLINICAL LAB TECHNOL, TECH	(10120050)	COEF= .200	INDUSTRIES:	001-184	
07.09.04	MEDICAL ASSISTING					
	OCCUPATION: 042 OTHER MEDICAL AND HEALTH WORKERS	(10100550)	COEF= .600	INDUSTRIES:	001-184	
	045 HEALTH RECORD TECHNOL, TECH	(10120150)	.100		001-184	
	133 SECRETARIES, MEDICAL	(40020100)	.200		001-184	
	167 RECEPTIONISTS	(40061200)	.400		147,160-166	
07.09.05	CENTRAL SERVICE TECHNOLOGY					
	OCCUPATION: 170 STOCK CLERKS, STORE KEEPERS	(40061350)	COEF= 1.000	INDUSTRIES:	147,160-166	

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07.09.05	(CONTINUED)					
	OCCUPATION:	328 HEALTH AIDES, EXCEPT NURSING	(70060100)	COEF= .100	INDUSTRIES:	001-184
		367 STOCK HANDLERS	(80000500)	1.000		147,160-166
07.09.07	MEDIC I/MEDICAL EMERGENCY TECHNOLOGY					
	OCCUPATION:	328 HEALTH AIDES, EXCEPT NURSING	(70060100)	COEF= .200	INDUSTRIES:	001-184
		329 HEALTH TRAINEES	(70060150)	.300		001-184
07.09.08	DIETETIC TECHNOLOGY					
	OCCUPATION:	034 DIETITIANS	(10100150)	COEF= 1.000	INDUSTRIES:	001-184
		326 FOOD WORKERS, NEC, EXC PRIVATE	(70040350)	.300		001-184
07.09.11	MEDICAL PHOTOGRAPHY					
	OCCUPATION:	079 PHOTOGRAPHERS	(10220450)	COEF= 1.000	INDUSTRIES:	147,160-166
		296 PHOTOGRAPHIC PROCESS WORKERS	(61081100)	.300		001-184
07.09.12	MEDICAL ILLUSTRATING					
	OCCUPATION:	082 WRITERS, ARTISTS, ENTERTAIN NEC	(10220600)	COEF= 1.000	INDUSTRIES:	145-150,152,160-167, 178-180
07.99.01	CARDIO-PULMONARY TECHNOLOGY					
	OCCUPATION:	043 CLINICAL LAB TECHNOL, TECH	(10120050)	COEF= .200	INDUSTRIES:	001-184
		329 HEALTH TRAINEES	(70060150)	.300		001-184
07.99.02	NURSING HOME ADMINISTRATION					
	OCCUPATION:	109 HEALTH ADMINISTRATORS	(20040150)	COEF= 1.000	INDUSTRIES:	001-184

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MAP 17

07.99.02	(CONTINUED)					
	OCCUPATION: 111 OFFICIALS, ADMINS, PUB	(20040250)	COEF= 1.000	INDUSTRIES:	147,160-166	
	122 OTHER MGRS, ADMINISTRATORS	(20060400)	1.000		147,160-166	
07.99.03	PHARMACY ASSISTING (BASED ON THE NUNBER OF PHARMACISTS)					
	OCCUPATION: 036 PHARMACISTS	(10100250)	COEF= 1.000	INDUSTRIES:	001-184	
09.02.01	CARE AND GUIDANCE OF CHILDREN					
	OCCUPATION: 171 TEACHERS AIDES, EXC MONITORS	(40061400)	COEF= .200	INDUSTRIES:	001-184	
	340 CHILD CARE WORKERS, EXC PRIVATE	(70080400)	.400		001-184	
	344 SCHOOL MONITORS	(70080650)	1.000		001-184	
	353 CHILD CARE WORKERS	(70120050)	.700		001-184	
09.02.96	GUIDANCE ASSISTING					
	OCCUPATION: 087 RELIGIOUS WORKERS, EXC CLERGY	(10240250)	COEF= .500	INDUSTRIES:	001-184	
	098 SOCIAL WORKERS	(10240800)	.200		001-184	
	171 TEACHERS AIDES, EXC MONITORS	(40061400)	.200		001-184	
	328 HEALTH AIDES, EXCEPT NURSING	(70060100)	.100		001-184	
09.02.97	ALCOHOLISM COUNSELING					
	OCCUPATION: 040 THERAPISTS	(10100450)	COEF= .800	INDUSTRIES:	001-184	
	042 OTHER MEDICAL AND HEALTH WORKERS	(10100550)	.200		001-184	
	095 PERSONNEL LABOR RELATIONS	(10240650)	.100		001-184	
	098 SOCIAL WORKERS	(10240800)	.200		001-184	

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MAP 18

09.02.97 (CONTINUED)					
OCCUPATION:	328 HEALTH AIDES, EXCEPT NURSING	(70060100)	COEF= .100	INDUSTRIES:	001-184
09.02.98 HUMAN SERVICE					
OCCUPATION:	042 OTHER MEDICAL AND HEALTH WORKERS	(10100550)	COEF= .200	INDUSTRIES:	001-184
	087 RELIGIOUS WORKERS, EXC CLERGY	(10240250)	.500		001-184
	095 PERSONNEL LABOR RELATIONS	(10240650)	.100		001-184
	097 RECREATION WORKERS	(10240750)	.200		072-083,090-184
	098 SOCIAL WORKERS	(10240800)	.300		001-184
	171 TEACHERS AIDES, EXC MONITORS	(40061400)	.200		001-184
	328 HEALTH AIDES, EXCEPT NURSING	(70060100)	.100		001-184
	330 LAY MIDWIVES	(70060200)	1.000		001-184
	340 CHILD CARE WORKERS, EXC PRIVATE	(70080400)	.200		001-184
	346 WELFARE SERVICE AIDES	(70080750)	.300		001-184
09.02.99 SOCIAL SERVICE					
OCCUPATION:	097 RECREATION WORKERS	(10240750)	COEF= .200	INDUSTRIES:	072-083,090-184
	098 SOCIAL WORKERS	(10240800)	.200		001-184
	111 OFFICIALS, ADMINS, PUB	(20040250)	1.000		168-172,174-175
	171 TEACHERS AIDES, EXC MONITORS	(40061400)	.200		001-184
	334 ATTEN, RECREATION, AMUSEMENT	(70080100)	.100		001-184
	346 WELFARE SERVICE AIDES	(70080750)	.400		001-184
14.01.01 ACCOUNTING					
OCCUPATION:	083 ACCOUNTANTS	(10240050)	COEF= 1.000	INDUSTRIES:	001-184

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MAP 19

14.01.01 (CONTINUED)

OCCUPATION:	100 BANK, FINANCIAL MANAGERS	(20020050)	COEF= .300	INDUSTRIES:	001-184
	101 CREDIT MANAGERS	(20020100)	.200		C01-184
	107 ASSESS, CONTROL, LOC PUB ADMIN	(20040050)	.200		001-184
	111 OFFICIALS, ADMINS, PUB	(20040250)	..200		001-144,151,153-159, 173,176-177
	119 OFFICIALS OF LODGES, UNIONS	(20060250)	.200		001-184
	127 INSURANCE AGENTS, BROKERS, ETC	(30000250)	.200		001-184
	137 BOOKKEEPING, BILLING OPERATORS	(40040050)	1.000		001-184
	145 BILLING CLERKS	(40060100)	.500		001-184
	146 BOOKKEEPERS	(40060150)	.800		001-184
	147 CASHIERS	(40060200)	.500		001-069,137-184
	150 COLLECTORS, BILL AND ACCOUNT	(40060350)	.500		001-184
	163 PAYROLL, TIME KEEPING CLERKS	(40061000)	.500		001-134,137-184
	169 STATISTICAL CLERKS	(40061300)	.500		001-134,137-184
	170 STOCK CLERKS, STORE KEEPERS	(40061350)	.200		001-146,148-159,167-184

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14.01.05 TELLER TRAINING

OCCUPATION:	144 BANK TELLERS	(40060050)	COEF= .700	INDUSTRIES:	001-184
	147 CASHIERS	(40060200)	1.000		132-134

14.02.00 DATA PROCESSING

OCCUPATION:	021 MATHEMATICIANS	(10060100)	COEF= 1.000	INDUSTRIES:	001-184

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14.02.00 (CONTINUED)						
	OCCUPATION: 056 COMPUTER PROGRAMMERS	(10160050)	COEF=	1.000	INDUSTRIES:	001-184
	057 COMPUTER SYSTEMS ANALYSTS	(10160100)		1.000		001-184
	058 OTHER COMPUTER SPECIALISTS	(10160150)		1.000		001-184
	094 OPERATIONS, SYSTEMS RESEARCH	(10240600)		1.000		001-184
	107 ASSESS, CONTROL, LOC PUB ADMIN	(20040050)		.100		001-184
	111 OFFICIALS, ADMINS, PUB	(20040250)		.200		001-144,151,153-159, 173,176-177
	122 OTHER MGRS, ADMINISTRATORS	(20060400)		.100		001-092,095-111,116-146,148-159,167-184
	139 COMPUTER, PERIPHERAL EQUIP	(40040150)		1.000		001-184
	142 TABULATING MACHINE OPERATORS	(40040300)		1.000		001-184
	210 DATA PROCESSING MACH REPAIRERS	(50080350)		.200		001-184
14.02.02 KEYPUNCH						
	OCCUPATION: 141 KEYPUNCH OPERATORS	(40040250)	COEF=	1.000	INDUSTRIES:	001-184
14.03.01 DUPLICATING MACHINE OPERATION						
	OCCUPATION: 140 DUPLICATING MACHINE OPERATORS	(40040200)	COEF=	.700	INDUSTRIES:	001-184
	143 OTHER OFFICE MACHINE OPERATORS	(40040350)		.300		001-134,137-184
14.03.99 MICROGRAPHICS						
	OCCUPATION: 045 HEALTH RECORD TECHNOL, TECH	(10120150)	COEF=	.100	INDUSTRIES:	001-184
	085 ARCHIVISTS AND CURATORS	(10240150)		.100		001-184
	093 LIBRARIANS	(10240550)		.100		001-184

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14.03.99	(CONTINUED)					
	OCCUPATION:	146 BOOKKEEPERS	(40060150)	COEF= .100	INDUSTRIES:	001-184
		169 STATISTICAL CLERKS	(40061300)	.100		001-134,137-184
14.04.96	COMMUNITY PLANNING					
	OCCUPATION:	063 URBAN AND REGIONAL PLANNERS	(10180250)	COEF= 1.000	INDUSTRIES:	001-184
14.04.97	MEDICAL RECORDS TECHNOLOGY					
	OCCUPATION:	045 HEALTH RECORD TECHNOL, TECH	(10120150)	COEF= .300	INDUSTRIES:	001-184
		133 SECRETARIES, MEDICAL	(40020100)	.300		001-184
		156 FILE CLERKS	(40060650)	1.000		147,160-166
		167 RECEPTIONISTS	(40061200)	.200		147,160-166
14.04.98	LIBRARY TECHNOLOGY					
	OCCUPATION:	085 ARCHIVISTS AND CURATORS	(10240150)	COEF= .900	INDUSTRIES:	001-184
		093 LIBRARIANS	(10240550)	.800		001-184
		158 LIBRARY ATTENDANTS, ASSISTANT	(40060750)	1.000		001-184
14.04.99	MASS COMMUNICATIONS					
	OCCUPATION:	053 RADIO OPERATORS	(10140250)	COEF= .300	INDUSTRIES:	001-184
		076 EDITORS AND REPORTERS	(10220300)	1.000		001-184
		080 PUBLIC RELATIONS SPECIALISTS	(10220500)	.300		001-184
		081 RADIO, TV ANNOUNCERS	(10220550)	.600		001-184
		082 WRITERS, ARTISTS, ENTERTAIN NEC	(10220600)	.600		072-144,151,153-159, 168-177,181-184

14.05.04 STOCK AND INVENTORY CLERK

OCCUPATION:	160 MAIL HANDLER, EXC POST OFFICE	(40060850)	COEF= .500	INDUSTRIES:	001-134,137-184
	168 SHIPPING, RECEIVING CLERKS	(40061250)	1.000		001-184
	170 STOCK CLERKS, STORE KEEPERS	(40061350)	.400		001-146,148-159,167-184
	367 STOCK HANDLERS	(80000500)	1.000		001-146,148-159,167-184
	370 WAREHOUSE LABORERS, NEC	(80000650)	.600		001-184

14.06.00 PERSONNEL AND LABOR RELATIONS

OCCUPATION:	095 PERSONNEL LABOR RELATIONS	(10240650)	COEF= .600	INDUSTRIES:	001-184
	111 OFFICIALS, ADMINS, PUB	(20040250)	.700		145-146,148-150,152,167,178-184
	119 OFFICIALS OF LODGES, UNIONS	(20060250)	.400		001-184
	153 ENUMERATORS AND INTERVIEWERS	(40060500)	1.000		001-184

14.07.00 SECRETARIAL SCIENCE

OCCUPATION:	134 SECRETARIES, OTHER	(40020150)	COEF= .300	INDUSTRIES:	001-184
	135 STENOGRAPHERS	(40020200)	.400		001-184
	138 CALCULATING MACHINE OPERATORS	(40040100)	1.000		001-134,137-184
	140 DUPLICATING MACHINE OPERATORS	(40040200)	.300		001-184
	143 OTHER OFFICE MACHINE OPERATORS	(40040350)	.700		001-134,137-184
	145 BILLING CLERKS	(40060100)	.500		001-184
	148 CLERICAL ASSIST, SOC WELFARE	(40060250)	1.000		001-184
	149 CLERICAL SUPERVISORS, NEC	(40060300)	1.000		001-134,137-184

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14.07.00	(CONTINUED)					
	OCCUPATION:	156 FILE CLERKS	(40060650)	COEF= 1.000	INDUSTRIES:	001-134,137-146,148-159,167-184
		160 MAIL HANDLER, EXC POST OFFICE	(40060850)	.500		001-134,137-184
		163 PAYROLL, TIME KEEPING CLERKS	(40061000)	.500		001-134,137-184
		167 RECEPTIONISTS	(40061200)	.500		001-146,148-156,167-184
		169 STATISTICAL CLERKS	(40061300)	.400		001-134,137-184
		177 MISC CLERICAL WORKERS, NEC	(40061700)	.700		001-134,137-184
B24 14.07.02	MEDICAL SECRETARY					
	OCCUPATION:	045 HEALTH RECORD TECHNOL, TECH	(10120150)	COEF= .200	INDUSTRIES:	001-184
		133 SECRETARIES, MEDICAL	(40020100)	.300		001-184
14.07.03	STENOGRAPHER					
	OCCUPATION:	134 SECRETARIES, OTHER	(40020150)	COEF= .200	INDUSTRIES:	001-184
		135 STENOGRAPHERS	(40020200)	.500		001-184
14.07.95	INSURANCE SECRETARY					
	OCCUPATION:	134 SECRETARIES, OTHER	(40020150)	COEF= .200	INDUSTRIES:	001-184
		136 TYPISTS	(40020250)	1.000		135
		138 CALCULATING MACHINE OPERATORS	(40040100)	1.000		135
		143 OTHER OFFICE MACHINE OPERATORS	(40040350)	1.000		135
		147 CASHIERS	(40060200)	1.000		135
		149 CLERICAL SUPERVISORS, NEC	(40060300)	1.000		135

14.07.95 (CONTINUED)

OCCUPATION:	156 FILE CLERKS	(40060650)	COEF= 1.000	INDUSTRIES:	135
	160 MAIL HANDLER, EXC POST OFFICE	(40060850)	1.000		135
	163 PAYROLL, TIME KEEPING CLERKS	(40061000)	1.000		135
	169 STATISTICAL CLERKS	(40061300)	1.000		135
	177 MISC CLERICAL WORKERS, NEC	(40061700)	1.000		135

14.07.96 REAL ESTATE SECRETARY

OCCUPATION:	134 SECRETARIES, OTHER	(40020150)	COEF= .200	INDUSTRIES:	001-184
	136 TYPISTS	(40020250)	1.000		136
	138 CALCULATING MACHINE OPERATORS	(40040100)	1.000		136
	143 OTHER OFFICE MACHINE OPERATORS	(40040350)	1.000		136
	147 CASHIERS	(40060200)	1.000		136
	149 CLERICAL SUPERVISORS, NEC	(40060300)	1.000		136
	156 FILE CLERKS	(40060650)	1.000		136
	160 MAIL HANDLER, EXC POST OFFICE	(40060850)	1.000		136
	163 PAYROLL, TIME KEEPING CLERKS	(40061000)	1.000		136
	169 STATISTICAL CLERKS	(40061300)	1.000		136
	177 MISC CLERICAL WORKERS, NEC	(40061700)	1.000		136

14.07.97 MEDICAL TRANSCRIPTION

OCCUPATION:	045 HEALTH RECORD TECHNOL, TECH	(10120150)	COEF= .300	INDUSTRIES:	001-184
	133 SECRETARIES, MEDICAL	(40020100)	.200		001-184

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MAP 25

14.07.98	LEGAL SECRETARY					
	OCCUPATION:	111 OFFICIALS, ADMINS, PUB	(20040250)	COEF= .300	INDUSTRIES:	145-146,148-150,152, 167,178-184
		132 SECRETARIES, LEGAL	(40020050)	1.000		001-184
14.07.99	COURT REPORTER					
	OCCUPATION:	135 STENOGRAPHERS	(40020200)	COEF= .100	INDUSTRIES:	001-184
14.08.05	BUSINESS MANAGEMENT					
	OCCUPATION:	100 BANK, FINANCIAL MANAGERS	(20020050)	COEF= .300	INDUSTRIES:	001-184
		101 CREDIT MANAGERS	(20020100)	.300		001-184
		104 PURCHASING AGENTS, BUYERS, NEC	(20020250)	.200		001-184
		105 SALES MANAGER, RETAIL TRADE	(20020300)	.300		006-010,013-092,095-102,104,106-111,116-123,125-136,139-144
		105 SALES MANAGER, RETAIL TRADE	(20020300)	.300		147,151,153-166,168-176,181-184
		106 SALES MANAGER, EXC RET TRADE	(20020350)	.300		006-092,095-111,116-136,139-176,178-184
		107 ASSESS, CONTROL, LOC PUB ADMIN	(20040050)	.300		001-184
		111 OFFICIALS, ADMINS, PUB	(20040250)	.600		001-144,151,153-159,173,176-177
		116 MGRS, SUPERINTENDENTS, BLDG	(20060100)	.100		001-184
		117 OFFICE MANAGERS, NEC	(20060150)	.700		001-123,125-136,139-176,178-184
		119 OFFICIALS OF LODGES, UNIONS	(20060250)	.400		001-184
		122 OTHER MGRS, ADMINISTRATORS	(20060400)	.100		001-092,095-111,116-146,148-159,167-184

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14.08.05	(CONTINUED)					
	OCCUPATION: 373 FARM MANAGERS	(90020100)	COEF= .100	INDUSTRIES:	001-184	
14.08.99	LEGAL ASSISTING (BASED ON THE NUMBER OF LAWYERS)					
	OCCUPATION: 092 LAWYERS	(10240500)	COEF= 1.000	INDUSTRIES:	001-184	
14.09.00	TYPIST (AND RELATED OCCUPATIONS)					
	OCCUPATION: 134 SECRETARIES, OTHER	(40020150)	COEF= .100	INDUSTRIES:	001-184	
	136 TYPISTS	(40020250)	1.000		001-134,137-184	
16.01.00	ENGINEERING TECHNOLOGY					
	OCCUPATION: 031 ENGINEERING, SCIENCE TECH NEC	(10080450)	COEF= .200	INDUSTRIES:	001-058,060-068,070-184	
16.01.03	CONSTRUCTION TECHNOLOGY					
	OCCUPATION: 030 SURVEYORS	(10080400)	COEF= .100	INDUSTRIES:	006-009,013-184	
	031 ENGINEERING, SCIENCE TECH NEC	(10080450)	.100		001-058,060-068,070-184	
16.01.05	CHEMICAL TECHNOLOGY					
	OCCUPATION: 015 CHEMISTS	(10040200)	COEF= .200	INDUSTRIES:	001-184	
	024 CHEMICAL TECHNICIANS	(10080100)	1.000		001-184	
	055 OTHER TECHNICIANS EXC HEALTH	(10140350)	.100		001-184	
16.01.06	CIVIL ENGINEERING TECHNOLOGY					
	OCCUPATION: 003 ENGINEERS, CIVIL	(10020150)	COEF= .200	INDUSTRIES:	001-184	

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MAP 27

16.01.06 (CONTINUED)

OCCUPATION:	025 DRAFTERS	(10080150)	COEF=	.100	INDUSTRIES:	001-184
	030 SURVEYORS	(10080400)		.300		006-009,013-184
	108 CONSTRUCTION INSPECTOR, PUB	(20040100)		.400		001-184
	279 SURVEY HELPERS	(61080250)		.400		001-184

16.01.07 ELECTRICAL POWER TECHNOLOGY
ALSO SEE 16.01.09 ELECTROMECHANICAL TECH

OCCUPATION:	004 ENGINEERS, ELECTRICAL	(10020200)	COEF=	.100	INDUSTRIES:	001-184
	026 ELECTRICAL, ELECTRONIC TECH	(10080200)		.100		001-184
	182 ELECTRICIANS AND APPRENTICES	(50020350)		.500		001-039,041-184
	182 ELECTRICIANS AND APPRENTICES	(50020350)		.350		040
	228 POWER STATION OPERATORS	(50120200)		.500		001-184

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16.01.08 ELECTRONIC TECHNOLOGY
ALSO SEE 16.01.09 ELECTROMECHANICAL TECH

OCCUPATION:	004 ENGINEERS, ELECTRICAL	(10020200)	COEF=	.100	INDUSTRIES:	001-184
	026 ELECTRICAL, ELECTRONIC TECH	(10080200)		.300		001-184
	110 INSPECTORS, EXC CONSTRUCT PUB	(20040200)		.300		001-184
	210 DATA PROCESSING MACH REPAIRERS	(50080350)		.400		001-184

16.01.09 ELECTROMECHANICAL TECHNOLOGY
ALSO SEE 16.01.07 ELECTRICAL POWER TECH.
AND 16.01.08 ELECTRONIC TECH.

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OCCUPATION:	026 ELECTRICAL, ELECTRONIC TECH	(10080200)	COEF=	.100	INDUSTRIES:	001-184
	028 MATHEMATICAL TECHN	(10080300)		.200		001-184

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MAP 28

16.01.09	(CONTINUED)					
	OCCUPATION: 210 DATA PROCESSING MACH REPAIRERS	(50080350)	COEF=	.200	INDUSTRIES:	001-184
16.01.10	ENVIRONMENTAL CONTROL TECHNOLOGY COMMERCIAL REFRIG/ AIR CONDITIONING					
	OCCUPATION: 031 ENGINEERING, SCIENCE TECH NEC	(10080450)	COEF=	.100	INDUSTRIES:	001-058,060-068,070-184
	055 OTHER TECHNICIANS EXC HEALTH	(10140350)		.100		001-184
16.01.11	INDUSTRIAL TECHNOLOGY					
	OCCUPATION: 025 DRAFTERS	(10080150)	COEF=	.100	INDUSTRIES:	001-184
	027 INDUSTRIAL ENGINEERING TECH	(10080250)		.800		001-184
	028 MATHEMATICAL TECHN	(10080300)		.100		001-184
	054 TOOL PROGRAMMERS, NUMERICAL	(10140300)		.200		001-184
	155 EXPEDITORS, PROD CONTROLLERS	(40060600)		.500		001-184
16.01.13	MECHANICAL ENGINEERING TECHNOLOGY (INCLUDES 30% OF MECHANICAL ENGINEERS)					
	OCCUPATION: 006 ENGINEERS, MECHANICAL	(10020300)	COEF=	.300	INDUSTRIES:	001-184
	025 DRAFTERS	(10080150)		.100		001-184
	028 MATHEMATICAL TECHN	(10080300)		.500		001-184
16.01.15	NUCLEAR TECHNOLOGY					
	OCCUPATION: 031 ENGINEERING, SCIENCE TECH NEC	(10080450)	COEF=	.100	INDUSTRIES:	001-058,060-068,070-184
	055 OTHER TECHNICIANS EXC HEALTH	(10140350)		.100		001-184

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16.01.16	NATURAL GAS AND PETROLEUM TECHNOLOGY					
	OCCUPATION: 009 ENGINEERS, PETROLEUM	(10020450)	COEF=	.200	INDUSTRIES:	001-184
	055 OTHER TECHNICIANS EXC HEALTH	(10140350)		.050		001-184
16.01.51	ENVIRONMENTAL TECHNOLOGY					
	OCCUPATION: 031 ENGINEERING, SCIENCE TECH NEC	(10080450)	COEF=	.100	INDUSTRIES:	001-058,060-068,070-184
16.01.52	CONCRETE TECHNOLOGY					
	OCCUPATION: 108 CONSTRUCTION INSPECTOR, PUB	(20040100)	COEF=	.300	INDUSTRIES:	001-184
	181 CEMENT AND CONCRETE FINISHERS	(50020300)		.400		001-184
16.01.54	LAND SURVEY TECHNOLOGY					
	OCCUPATION: 030 SURVEYORS	(10080400)	COEF=	.600	INDUSTRIES:	006-009,013-184
	279 SURVEY HELPERS	(61080250)		.500		001-184
16.01.94	QUALITY CONTROL TECHNOLOGY					
	OCCUPATION: 155 EXPEDITORS, PROD CONTROLLERS	(40060600)	COEF=	.200	INDUSTRIES:	001-184
	241 INSPECTORS, OTHER	(50140550)		.200		001-184
	270 CHECKERS, EXAMINERS, ETC, MFG	(61060050)		.200		001-184
	271 GRADERS AND SORTERS, MFG	(61060100)		.300		001-184
16.01.95	COMMUNICATIONS ELECTRONICS ALSO SEE 16.01.97 INDUSTRIAL ELECTRONICS AND 16.01.98 AVIATION ELECTRONICS					
	OCCUPATION: 026 ELECTRICAL, ELECTRONIC TECH	(10080200)	COEF=	.100	INDUSTRIES:	001-184

16.01.95 (CONTINUED)

OCCUPATION:	053 RADIO OPERATORS	(10140250)	COEF= .400	INDUSTRIES:	001-184
	081 RADIO, TV ANNOUNCERS	(10220550)	.400		001-184
	216 RADIO, TELEVISION REPAIRERS	(50080650)	1.000		001-184

16.01.96 BIOMEDICAL EQUIPMENT
MAINTENANCE AND REPAIR

OCCUPATION:	026 ELECTRICAL, ELECTRONIC TECH	(10080200)	COEF= .100	INDUSTRIES:	001-184
	055 OTHER TECHNICIANS EXC HEALTH	(10140350)	.050		001-184

16.01.97 INDUSTRIAL ELECTRONICS
ALSO SEE 16.01.95 COMMUNICATION ELECT.
AND 16.01.98 AVIATION ELECT.

OCCUPATION:	026 ELECTRICAL, ELECTRONIC TECH	(10080200)	COEF= .100	INDUSTRIES:	001-184

16.01.98 AVIATION ELECTRONICS
ALSO SEE 16.01.95 COMMUNICATION ELECT.
AND 16.01.97 INDUSTRIAL ELECT.

OCCUPATION:	026 ELECTRICAL, ELECTRONIC TECH	(10080200)	COEF= .100	INDUSTRIES:	001-184
	052 FLIGHT ENGINEERS	(10140200)	.300		001-184
	053 RADIO OPERATORS	(10140250)	.200		001-184
	206 AIRCRAFT MECHANICS AND REPAIRERS	(50080100)	.300		001-184

16.01.99 MARINE TECHNOLOGY
ALSO SEE 16.06.04 MARINE SCIENCE TECH.

OCCUPATION:	017 MARINE SCIENTISTS	(10040300)	COEF= .200	INDUSTRIES:	001-184
	031 ENGINEERING, SCIENCE TECH NEC	(10080450)	.100		001-058,060-068,070-184

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16.01.99 (CONTINUED)

OCCUPATION:	055 OTHER TECHNICIANS EXC HEALTH	(10140350)	COEF= .200	INDUSTRIES:	001-184
	298 SAILORS AND DECKHANDS	(61081200)	.200		001-184

16.02.03 FOOD PROCESSING TECHNOLOGY

OCCUPATION:	272 MEAT WRAPPER, RETAIL TRADE	(61060150)	COEF= 1.000	INDUSTRIES:	001-184
	290 MEAT CUTTERS, BUTCHERS	(61060800)	.100		001-184
	322 COOKS, EXC PRIVATE	(70040150)	.300		001-184
	326 FOOD WORKERS, NEC, EXC PRIVATE	(70040350)	.100		001-184
	361 FISHERS, HUNTERS AND TRAPPERS	(80000200)	.300		001-184

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16.05.98 EXECUTIVE HOUSEKEEPING TECHNOLOGY

OCCUPATION:	090 HOME MANAGEMENT ADVISORS	(10240400)	COEF= .500	INDUSTRIES:	001-089,132-184
	317 LODGING QTRS CLEANERS, EXC PRIV	(70020050)	.500		001-184
	318 BUILDING INTERIOR CLEANERS, NEC	(70020100)	.400		001-184
	319 JANITORS AND SEXTONS	(70020150)	.500		001-184
	343 HOUSEKEEPERS, EXC PRIVATE	(70080550)	.600		001-184

16.06.01 COMMERCIAL PILOT

OCCUPATION:	049 AIRPLANE PILOTS	(10140050)	COEF= 1.000	INDUSTRIES:	001-184
	052 FLIGHT ENGINEERS	(10140200)	.700		001-184

16.06.03 FORESTRY TECHNOLOGY
ALSO SEE 01.07.00 INDUSTRIAL FORESTRY

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OCCUPATION:	030 SURVEYORS	(10080400)	COEF= 1.000	INDUSTRIES:	001-005,010-012

16.06.03	(CONTINUED)					
	OCCUPATION:	089 FORESTERS, CONSERVATIONISTS	(10240350)	COEF= .200	INDUSTRIES:	001-184
		240 INSPECTORS, LOG AND LUMBER	(50140500)	.500		001-184
		279 SURVEY HELPERS	(61080250)	.100		001-184
16.06.04	MARINE SCIENCE TECHNOLOGY ALSO SEE 16.01.99 MARINE TECHNOLOGY					
	OCCUPATION:	017 MARINE SCIENTISTS	(10040300)	COEF= .200	INDUSTRIES:	001-184
		023 AGRI, BIOLOG TECH EXC HEALTH	(10080050)	.200		001-184
16.06.96	OCEANOGRAPHIC TECHNOLOGY					
	OCCUPATION:	031 ENGINEERING, SCIENCE TECH NEC	(10080450)	COEF= .050	INDUSTRIES:	001-058,060-068,070-184
		055 OTHER TECHNICIANS EXC HEALTH	(10140350)	.100		001-184
16.06.97	MARINE BIOLOGY TECHNOLOGY					
	OCCUPATION:	031 ENGINEERING, SCIENCE TECH NEC	(10080450)	COEF= .050	INDUSTRIES:	001-058,060-068,070-184
		055 OTHER TECHNICIANS EXC HEALTH	(10140350)	.100		001-184
16.06.98	DIVING TECHNOLOGY					
	OCCUPATION:	031 ENGINEERING, SCIENCE TECH NEC	(10080450)	COEF= .100	INDUSTRIES:	001-058,060-068,070-184
		055 OTHER TECHNICIANS EXC HEALTH	(10140350)	.050		001-184
16.06.99	SIGN LANGUAGE INTERPRETER					
	OCCUPATION:	098 SOCIAL WORKERS	(10240800)	COEF= .100	INDUSTRIES:	001-184

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MAP 33

16.06.99	(CONTINUED)					
	OCCUPATION: 171 TEACHERS AIDES, EXC MONITORS	(40061400)	COEF= .200	INDUSTRIES:	001-184	
17.01.00	COMMERCIAL REFRIGERATION AND AIR CONDITIONING MAINTENANCE					
	OCCUPATION: 205 AIR COND, HEATING, REFRIG	(50080050)	COEF= 1.000	INDUSTRIES:	001-184	
17.02.00	APPLIANCE AND VENDING MACHINE REPAIR					
	OCCUPATION: 213 HOUSEHOLD APPLIANCE MECHANICS	(50080500)	COEF= 1.000	INDUSTRIES:	001-184	
17.03.01	AUTO BODY REBUILDING					
	OCCUPATION: 157 INSURANCE ADJUST, EXAM	(40060700)	COEF= .200	INDUSTRIES:	001-184	
	208 AUTO BODY REPAIRERS	(50080200)	1.000		001-039,041-184	
	208 AUTO BODY REPAIRERS	(5008020C)	.700		040	
	239 GLAZIERS	(50140450)	.200		001-184	
17.03.02	AUTOMOTIVE MECHANICS					
	OCCUPATION: 207 AUTO ACCESSORIES INSTALLERS	(50080150)	COEF= .500	INDUSTRIES:	072-080,090,116-119, 151,153-156	
	209 AUTO MECHANICS AND APPRENTICES	(50080250)	1.000		001-184	
17.03.03	AUTOMOTIVE MACHINIST					
	OCCUPATION: 198 MACHINISTS AND APPRENTICES	(50060300)	COEF= 1.000	INDUSTRIES:	028,075,116-119,153	
17.03.98	TRAILER REBUILDING AND REFINISHING					
	OCCUPATION: 178 CARPENTERS AND APPRENTICES	(50020050)	COEF= .300	INDUSTRIES:	040	

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MAP 34

17.03.98 (CONTINUED)

OCCUPATION:	182 ELECTRICIANS AND APPRENTICES	(50020350)	COEF= .300	INDUSTRIES:	040
	184 FLOOR LAYERS, EXC TILE SETTERS	(50020500)	.300		040
	186 PLUMBERS,PIPEFITTERS AND APPRENTICE	(50020800)	.300		040
	203 SHEET METAL WORKERS AND APPRENTICES	(50060650)	.300		040
	208 AUTO BODY REPAIRERS	(50080200)	.300		040
	232 CABINETMAKERS	(50140100)	.300		040
	253 UPHOLSTERERS	(50141150)	.300		040
	263 SOLDERERS	(61020450)	.300		040
	275 ASBESTOS, INSULATION WORKERS	(61080050)	.300		040
	297 RIVETERS AND FASTENERS	(61081150)	.300		040

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17.03.99 COMMERCIAL DRIVING

OCCUPATION:	307 BUS DRIVERS	(62000100)	COEF= .600	INDUSTRIES:	001-184
	309 DELIVERY AND ROUTE WORKERS	(62000200)	.600		001-184
	310 FORK LIFT, TOW MOTOR OPR	(62000250)	.600		001-184
	311 RAIL VEHICLE OPERATORS,NEC	(62000300)	.400		001-184
	315 TAXICAB DRIVERS, CHAUFFEURS	(62000500)	1.000		001-184
	316 TRUCK DRIVERS	(62000550)	1.000		001-184
	366 TEAMSTERS	(80000550)	1.000		001-184

17.04.01 AIRCRAFT MECHANICS

OCCUPATION:	206 AIRCRAFT MECHANICS AND REPAIRERS	(50080100)	COEF= .700	INDUSTRIES:	001-184

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MAP 35

17.04.01	(CONTINUED)					
	OCCUPATION:	218 OTHER MECHANICS AND APPRENTICES	(50080750)	COEF= 1.000	INDUSTRIES:	038,078
17.04.03	AIR TRAFFIC CONTROL					
	OCCUPATION:	050 AIR TRAFFIC CONTROLLERS	(10140100)	COEF= 1.000	INDUSTRIES:	001-184
		053 RADIO OPERATORS	(10140250)	.100		001-184
17.06.00	OFFICE MACHINE REPAIR					
	OCCUPATION:	210 DATA PROCESSING MACH REPAIRERS	(50080350)	COEF= .200	INDUSTRIES:	001-184
		215 OFFICE MACHINE REPAIRERS	(50080600)	1.000		001-184
17.07.00	COMMERCIAL ART					
	OCCUPATION:	075 DESIGNERS	(10220250)	COEF= .200	INDUSTRIES:	001-184
		078 PAINTERS AND SCULPTORS	(10220400)	.800		001-184
		079 PHOTOGRAPHERS	(10220450)	1.000		090-131,139-144,173, 176
		235 DECORATORS, WINDOW DRESSERS	(50140250)	.200		001-184
		249 SIGN PAINTERS AND LETTERERS	(50140950)	1.000		001-184
17.07.01	INTERIOR DECORATION ALSO SEE 17.10.05 PAINTING AND DECORATING					
	OCCUPATION:	075 DESIGNERS	(10220250)	COEF= .100	INDUSTRIES:	001-184
		185 PAINTERS AND APPRENTICES	(50020550)	.400		001-184
		186 PAPERHANGERS	(50020650)	.500		001-184
		235 DECORATORS, WINDOW DRESSERS	(50140250)	.200		001-184

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MAP 36

17.07.03	PRODUCT/PACKAGE DESIGN TECHNOLOGY					
	OCCUPATION: 075 DESIGNERS	(10220250)	COEF= .100	INDUSTRIES:	001-184	
17.08.00	COMMERCIAL FISHING					
	OCCUPATION: 218 OTHER MECHANICS AND APPRENTICES	(50080750)	COEF= .200	INDUSTRIES:	039	
	247 SHIPFITTERS	(50140850)	.100		001-184	
17.08.02	MARINE MAINTENANCE AND REPAIR POWER BOAT MECHANICS ALSO SEE 17.10.98 MARINE CARPENTRY					
	OCCUPATION: 218 OTHER MECHANICS AND APPRENTICES	(50080750)	COEF= .800	INDUSTRIES:	039	
	247 SHIPFITTERS	(50140850)	.300		001-184	
17.09.00	PHOTOGRAPHY ALSO SEE 17.09.99 PHOTO-JOUNALISM					
	OCCUPATION: 079 PHOTOGRAPHERS	(10220450)	COEF= .500	INDUSTRIES:	001-080,084-089,132-138,145-146,148-159,167-172,174-175	
	079 PHOTOGRAPHERS	(10220450)	.500		177-184	
	296 PHOTOGRAPHIC PROCESS WORKERS	(61081100)	.400		001-184	
17.09.99	PHOTO-JOURNALISM ALSO SEE 17.09.00 PHOTOGRAPHY					
	OCCUPATION: 079 PHOTOGRAPHERS	(10220450)	COEF= .500	INDUSTRIES:	001-080,084-089,132-138,145-146,148-159,167-172,174-175	
	079 PHOTOGRAPHERS	(10220450)	.500		177-184	
	080 PUBLIC RELATIONS SPECIALISTS	(10220500)	.200		001-184	

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MAP 37

17.09.99 (CONTINUED)

OCCUPATION:	082 WRITERS, ARTISTS, ENTERTAIN NEC	(10220600)	COEF= .400	INDUSTRIES:	072-144,151,153-159, 168-177,181-184

17.10.01 CARPENTRY

OCCUPATION:	108 CONSTRUCTION INSPECTOR, PUB	(20040100)	COEF= .200	INDUSTRIES:	001-184
	178 CARPENTERS AND APPRENTICES	(50020050)	1.000		001-038,041-071,073-076,078,081-184
	178 CARPENTERS AND APPRENTICES	(50020050)	.700		040
	184 FLOOR LAYERS, EXC TILE SETTERS	(50020500)	1.000		001-039,041-184
	184 FLOOR LAYERS, EXC TILE SETTERS	(50020500)	.700		040
	201 PATTERN AND MODEL MAKERS	(50060550)	.400		001-058,060-069,070-184
	232 CABINETMAKERS	(50140100)	.280		040
	232 CABINETMAKERS	(50140100)	.400		001-038,041-184
	254 CRAFT AND KINDRED WORKERS, NEC	(50141200)	.300		001-184
	359 CARPENTERS, HELPERS	(80000100)	1.000		001-038,040-071,073-076,078,081-184

17.10.03 HEAVY EQUIPMENT OPERATION
SEE 17.03.99 COMMERCIAL DRIVING

OCCUPATION:	212 HEAVY EQUIP MECH, INCL DIESEL	(50080450)	COEF= .700	INDUSTRIES:	006-184
	218 OTHER MECHANICS AND APPRENTICES	(50080750)	.100		001-037,040-077,079-184

17.10.04 MASONRY

OCCUPATION:	179 BRICK AND STONEMASONS AND APPR	(50020150)	COEF= 1.000	INDUSTRIES:	001-184

17.10.04 (CONTINUED)

OCCUPATION:	181 CEMENT AND CONCRETE FINISHERS	(50020300)	COEF= .600	INDUSTRIES:	001-184

17.10.05 PAINTING AND DECORATING
ALSO SEE 17.07.01 INTERIOR DECORATION

OCCUPATION:	185 PAINTERS AND APPRENTICES	(50020550)	COEF= .600	INDUSTRIES:	001-184
	186 PAPERHANGERS	(50020650)	.500		001-184

17.10.08 DRYWALL INSTALLATION

OCCUPATION:	187 PLASTERERS AND APPRENTICES	(50020700)	COEF= .200	INDUSTRIES:	001-184
	284 DRY WALL INSTALLERS, LATHERS	(61080500)	1.000		001-184

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17.10.98 MARINE CARPENTRY
ALSO SEE 17.08.00 COMMERCIAL FISHING AND
17.08.02 MARINE MAINTENANCE

OCCUPATION:	178 CARPENTERS AND APPRENTICES	(50020050)	COEF= 1.000	INDUSTRIES:	039,072,077,079-080
	232 CABINETMAKERS	(50140100)	1.000		039
	247 SHIPFITTERS	(50140850)	.200		001-184
	254 CRAFT AND KINDRED WORKERS, NEC	(50141200)	.300		001-184
	359 CARPENTERS, HELPERS	(80000100)	1.000		039,072,077,079-080

17.10.99 INDUSTRIAL MAINTENANCE TECHNOLOGY

OCCUPATION:	108 CONSTRUCTION INSPECTOR, PUB	(20040100)	COEF= .100	INDUSTRIES:	001-184
	193 BLACKSMITHS	(50060050)	.500		006-184
	194 BOILERMAKERS	(50060100)	.300		001-184
	199 MILLWRIGHTS	(50060400)	1.000		001-184

17.10.99 (CONTINUED)

OCCUPATION:	207 AUTO ACCESSORIES INSTALLERS	(50080150)	COEF= 1.000	INDUSTRIES:	001-071,081-089,091-115,120-150,152,157-184
	218 OTHER MECHANICS AND APPRENTICES	(50080750)	.250		001-037,040-077,079-184
	254 CRAFT AND KINDRED WORKERS, NEC	(50141200)	.300		001-184
	294 OILERS, GREASERS, EXC AUTO	(61081000)	1.000		001-184

17.11.00 CUSTODIAL SERVICES

OCCUPATION:	090 HOME MANAGEMENT ADVISORS	(10240400)	COEF= .500	INDUSTRIES:	001-089,132-184
	317 LODGING QTRS CLEANERS, EXC PRIV	(70020050)	.500		001-184
	318 BUILDING INTERIOR CLEANERS, NEC	(70020100)	.600		001-184
	319 JANITORS AND SEXTONS	(70020150)	.500		001-184

17.12.00 DIESEL AND HEAVY EQUIPMENT MECHANICS

OCCUPATION:	180 BULLDOZER OPERATORS	(50020250)	COEF= 1.000	INDUSTRIES:	001-184
	183 EXCAVATING, GRADING, MACH OP	(50020450)	1.000		001-184
	212 HEAVY EQUIP MECH, INCL DIESEL	(50080450)	.300		006-184
	234 CRANE, DERRICK, HOIST OPERATORS	(50140200)	1.000		001-184
	283 DRILLERS, EARTH	(61080450)	.600		001-184
	310 FORK LIFT, TOW MOTOR OPR	(62000250)	.400		001-184
	311 RAIL VEHICLE OPERATORS,NEC	(62000300)	.600		001-184

17.13.00 DRAFTING
ALSO SEE 17.13.02 TECHNICAL ILLUSTRATION

OCCUPATION:	025 DRAFTERS	(10080150)	COEF= .500	INDUSTRIES:	001-184

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MAP 40

17.13.00	(CONTINUED)					
	OCCUPATION: 027 INDUSTRIAL ENGINEERING TECH	(10080250)	COEF=	.200	INDUSTRIES:	001-184
	028 MATHEMATICAL TECHN	(10080300)		.200		001-184
17.13.02	TECHNICAL ILLUSTRATION ALSO SEE 17.13.00 DRAFTING					
	OCCUPATION: 025 DRAFTERS	(10080150)	COEF=	.200	INDUSTRIES:	001-184
	078 PAINTERS AND SCULPTORS	(10220400)		.200		001-184
17.14.01	INDUSTRIAL ELECTRICITY					
	OCCUPATION: 182 ELECTRICIANS AND APPRENTICES	(50020350)	COEF=	.500	INDUSTRIES:	001-039,041-184
	182 ELECTRICIANS AND APPRENTICES	(50020350)		.350		040
	225 ELEC POWR LINE INSTALL AND REPAIR	(50120050)		.400		001-184
	229 TELEPHONE INSTALLERS, REPAIRERS	(50120250)		.500		001-184
	230 TELEPHONE LINE INSTALL AND REPAIR	(50120300)		1.000		001-184
17.15.02	AUDIOVISUAL EQUIPMENT REPAIR					
	OCCUPATION: 093 LIBRARIANS	(10240550)	COEF=	.100	INDUSTRIES:	001-184
17.16.01	DRYCLEANING					
	OCCUPATION: 280 CLOTHING IRONERS AND PRESSERS	(61080300)	COEF=	1.000	INDUSTRIES:	001-009,072-184
	288 LAUNDRY, DRY CLEAN OP, NEC	(61080700)		.700		001-184
17.19.00	GRAPHIC ARTS/PRINTING ALSO SEE 17.19.98 VISUAL COMMUNICATION AND 17.19.99 MEDIA TECHNICIAN					
	OCCUPATION: 219 BOOKBINDERS	(50100050)	COEF=	1.000	INDUSTRIES:	001-184

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MAP 41

17.19.00 (CONTINUED)

OCCUPATION:	220 COMPOSITORS AND TYP SETTERS	(50100100)	COEF= 1.000	INDUSTRIES:	001-184
	221 ELECTROTYPERS, STEREOTYPERS	(50100150)	1.000		001-184
	222 ENGRAVERS EXC PHOTOENGRAVERS	(50100200)	1.000		001-058,060-068,070-184
	223 PHOTOENGRAVERS, LITHOGRAPHERS	(50100250)	1.000		001-184
	224 PRINTING PRESS OPERATORS AND APPR	(50100300)	1.000		001-184

17.19.05 SILKSCREEN TECHNOLOGY

OCCUPATION:	123 ADVERTISING AGENTS, SALES WORKERS	(30000050)	COEF= .100	INDUSTRIES:	001-184

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17.19.98 VISUAL COMMUNICATIONS
ALSO SEE 17.19.00 GRAPHIC ARTS/PRINTING
AND 17.19.99 MEDIA TECHNOLOGY

OCCUPATION:	079 PHOTOGRAPHERS	(10220450)	COEF= .500	INDUSTRIES:	081-083
	123 ADVERTISING AGENTS, SALES WORKERS	(30000050)	.200		001-184
	244 MOTION PICTURE PROJECTIONISTS	(50140700)	.500		001-184

17.19.99 MEDIA TECHNOLOGY
ALSO SEE 17.19.00 GRAPHIC ARTS/PRINTING
AND 17.19.98 VISUAL COMMUNICATIONS

OCCUPATION:	079 PHOTOGRAPHERS	(10220450)	COEF= .500	INDUSTRIES:	081-083
	244 MOTION PICTURE PROJECTIONISTS	(50140700)	.500		001-184
	296 PHOTOGRAPHIC PROCESS WORKERS	(61081100)	.300		001-184

17.20.03 INDUSTRIAL RADIOLOGY

OCCUPATION:	046 RADIOLOGIC TECHNOL, TECH	(10120200)	COEF= .200	INDUSTRIES:	001-184

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17.21.00	INSTRUMENT MAINTENANCE AND PRODUCTION ALSO SEE 17.21.02 INSTRUMENT AND WATCH REPAIR					
	OCCUPATION:	242 JEWELERS AND WATCHMAKERS	(50140600)	COEF= .500	INDUSTRIES:	001-184
17.21.02	INSTRUMENT AND WATCH REPAIR ALSO SEE 17.21.00 INSTRUMENT MAINTENANCE AND PRODUCTION					
	OCCUPATION:	242 JEWELERS AND WATCHMAKERS	(50140600)	COEF= .500	INDUSTRIES:	001-184
17.22.00	MARINE ENGINEER					
	OCCUPATION:	218 OTHER MECHANICS AND APPRENTICES	(50080750)	COEF= .100	INDUSTRIES:	001-037,040-077,079-184
17.23.02	MACHINE SHOP					
	OCCUPATION:	054 TOOL PROGRAMMERS, NUMERICAL	(10140300)	COEF= .800	INDUSTRIES:	001-184
		198 MACHINISTS AND APPRENTICES	(50060300)	1.000		001-027,029-074,076-115,120-152,154-184
		201 PATTERN AND MODEL MAKERS	(50060550)	.400		001-058,060-068,070-184
		204 TOOL AND DIEMAKERS AND APPRENTICES	(50060750)	.900		001-184
		255 DRILL PRESS OPERATIVES	(61020050)	1.000		001-184
		257 GRINDING MACHINE OPERATIVES	(61020150)	1.000		001-184
		259 LATHE, MILLING MACH OPERATIVES	(61020250)	1.000		001-184
		262 PUNCH STAMPING PRESS OPR	(61020400)	1.000		001-184
		304 MISC MACH OPERATIVES	(61081500)	1.000		001-058,060-068,070-184
17.23.05	SHEETMETAL					
	OCCUPATION:	202 ROLLERS AND FINISHERS, METAL	(50060600)	COEF= 1.000	INDUSTRIES:	001-184

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17.23.05	(CONTINUED)					
	OCCUPATION:	203 SHEET METAL WORKERS AND APPRENTICES	(50060650)	COEF= 1.000	INDUSTRIES:	001-039,041-184
		203 SHEET METAL WORKERS AND APPRENTICES	(50060650)	.700		040
		260 METAL PLATERS	(61020300)	1.000		001-184
		297 RIVETERS AND FASTENERS	(61081150)	1.000		001-039,041-184
		297 RIVETERS AND FASTENERS	(61081150)	.700		040
17.23.06	WELDING					
	OCCUPATION:	190 STRUCTURAL METAL CRAFT	(50020950)	COEF= 1.000	INDUSTRIES:	001-184
		193 BLACKSMITHS	(50060050)	.500		006-184
		263 SOLDERERS	(61020450)	1.000		001-039,041-184
		263 SOLDERERS	(61020450)	.700		040
		264 WELDERS AND FLAME CUTTERS	(61020500)	.950		001-184
17.24.00	MATERIALS TESTING					
	OCCUPATION:	110 INSPECTORS, EXC CONSTRUCT PUB	(20040200)	COEF= .200	INDUSTRIES:	001-184
		264 WELDERS AND FLAME CUTTERS	(61020500)	.050		001-184
17.26.01	BARBERING					
	OCCUPATION:	337 BARBERS	(70080250)	COEF= 1.000	INDUSTRIES:	001-184
17.26.02	COSMETOLOGY					
	OCCUPATION:	342 HAIRDRESSERS, COSMETOLOGISTS	(70080500)	COEF= 1.000	INDUSTRIES:	001-184
17.27.00	THERMOPLASTIC WELDING AND BONDING					
	OCCUPATION:	201 PATTERN AND MODEL MAKERS	(50060550)	COEF= .200	INDUSTRIES:	001-058,060-068,070-184

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17.27.02	PLASTICS TECHNOLOGY					
	OCCUPATION:	031 ENGINEERING, SCIENCE TECH NEC	(10080450)	COEF= 1.000	INDUSTRIES:	059,069
		197 JOB AND DIE SETTERS, METAL	(50060250)	1.000		059,069
		201 PATTERN AND MODEL MAKERS	(50060550)	1.000		059,069
		222 ENGRAVERS EXC PHOTOENGRAVERS	(50100200)	1.000		059,069
		304 MISC MACH OPERATIVES	(61081500)	1.000		059,069
17.28.01	FIRE SCIENCE/FIREMAN (PAID)					
	OCCUPATION:	348 FIRE FIGHTERS	(70100100)	COEF= 1.000	INDUSTRIES:	001-184
17.28.02	ADMINISTRATION OF JUSTICE					
	OCCUPATION:	107 ASSESS, CONTROL, LOC PUB ADMIN	(20040050)	COEF= .100	INDUSTRIES:	001-184
		157 INSURANCE ADJUST, EXAM	(40060700)	.300		001-184
		349 GUARDS	(70100150)	.800		001-184
		350 MARSHALS AND CONSTABLES	(70100200)	1.000		001-184
		351 POLICE AND DETECTIVES	(70100250)	1.000		001-184
		352 SHERIFFS AND BAILIFFS	(70100300)	1.000		001-184
17.29.01	BAKER					
	OCCUPATION:	231 BAKERS	(50140050)	COEF= 1.000	INDUSTRIES:	001-184
17.29.02	COMMERCIAL COOKING AND FOOD MANAGEMENT					
	OCCUPATION:	121 RESTAURANT, CAFE, BAR MGRS	(20060350)	COEF= .300	INDUSTRIES:	001-184
		289 MEAT CUTTERS, BUTCHERS, EXC MFG	(61080750)	.300		001-184

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MAP 45

17.29.02	(CONTINUED)					
	OCCUPATION:	320 BARTENDERS	(70040050)	COEF= .200	INDUSTRIES:	001-184
		321 WAITERS ASSISTANTS	(70040100)	.400		001-184
		322 COOKS, EXC PRIVATE	(70040150)	.700		001-184
		323 DISHWASHERS	(70040200)	.200		001-184
		324 FOOD COUNTER, FOUNTAIN WORKERS	(70040250)	.400		001-184
		325 WAITERS	(70040300)	.200		001-184
		326 FOOD WORKERS, NEC, EXC PRIVATE	(70040350)	.300		001-184
17.29.03	MEAT CUTTING					
	OCCUPATION:	290 MEAT CUTTERS, BUTCHERS	(61080800)	COEF= .500	INDUSTRIES:	001-184
17.29.04	WAITER/WAITRESS					
	OCCUPATION:	320 BARTENDERS	(70040050)	COEF= .200	INDUSTRIES:	001-184
		321 WAITERS ASSISTANTS	(70040100)	.600		001-184
		323 DISHWASHERS	(70040200)	.800		001-184
		324 FOOD COUNTER, FOUNTAIN WORKERS	(70040250)	.600		001-184
		325 WAITERS	(70040300)	.800		001-184
		326 FOOD WORKERS, NEC, EXC PRIVATE	(70040350)	.300		001-184
17.31.00	SMALL ENGINE REPAIR/RV MAINT.					
	OCCUPATION:	218 OTHER MECHANICS AND APPRENTICES	(50080750)	COEF= .250	INDUSTRIES:	001-037,040-077,079-184
17.32.01	ELECTRIC POWER GENERATION					
	OCCUPATION:	026 ELECTRICAL, ELECTRONIC TECH	(10080200)	COEF= .100	INDUSTRIES:	001-184

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MAP 46

17.32.01 (CONTINUED)

OCCUPATION:	225 ELEC POWR LINE INSTALL AND REPAIR	(50120050)	COEF= .400	INDUSTRIES:	001-184
	228 POWER STATION OPERATORS	(50120200)	.500		001-184
	250 STATIONARY ENGINEERS	(50141000)	.300		001-184

17.32.02 WASTE WATER TECHNOLOGY

OCCUPATION:	031 ENGINEERING, SCIENCE TECH NEC	(10080450)	COEF= .100	INDUSTRIES:	001-058,060-068,070-184
	055 OTHER TECHNICIANS EXC HEALTH	(10140350)	.150		001-184

B47 17.33.01 CUSTOM APPAREL DESIGN AND CONSTRUCTION

OCCUPATION:	252 TAILORS	(50141100)	COEF= .500	INDUSTRIES:	001-184
	282 DRESSMAKERS,EXC FACTORY	(61080400)	.500		001-184
	291 MILLINERS	(61080850)	.400		001-184
	300 SEWERS AND STITCHERS	(61081300)	.300		001-184

17.33.02 TAILORING
ALSO SEE 17.33.99 POWER SEWING

OCCUPATION:	252 TAILORS	(50141100)	COEF= .500	INDUSTRIES:	001-184
	282 DRESSMAKERS,EXC FACTORY	(61080400)	.500		001-184
	300 SEWERS AND STITCHERS	(61081300)	.300		001-184

17.33.99 POWER SEWING
ALSO SEE 17.33.02 TAILORING

OCCUPATION:	248 SHOE REPAIRERS	(50140900)	COEF= 1.000	INDUSTRIES:	001-184
	253 UPHOLSTERERS	(50141150)	.400		001-039,041-184

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MAP 47

17.33.99	(CONTINUED)					
	OCCUPATION:	253 UPHOLSTERERS	(50141150)	COEF= .350	INDUSTRIES:	040
		280 CLOTHING IRONERS AND PRESSERS	(61080300)	1.000		010-071
		288 LAUNDRY, DRY CLEAN OP, NEC	(61080700)	.300		001-184
		291 MILLINERS	(61080850)	.200		001-184
		300 SEWERS AND STITCHERS	(61081300)	.400		001-184
		301 SHOEMAKING MACHINE OPR	(61081350)	1.000		001-184
17.35.00	UPHOLSTERING					
	OCCUPATION:	237 FURNITURE AND WOOD FINISH	(50140350)	COEF= 1.000	INDUSTRIES:	001-184
		253 UPHOLSTERERS	(50141150)	.500		001-039,041-184
		253 UPHOLSTERERS	(50141150)	.280		040
17.36.01	CABINET MAKING AND MILLWORK					
	OCCUPATION:	232 CABINETMAKERS	(50140100)	COEF= .420	INDUSTRIES:	040
		232 CABINETMAKERS	(50140100)	.600		001-038,041-184
17.99.00	MUSICAL INSTRUMENT SERVICE AND REPAIR					
	OCCUPATION:	246 PIANO, ORGAN TUNERS, REPAIRERS	(50140800)	COEF= 1.000	INDUSTRIES:	001-184
99.0102	AGRICULTURAL SCIENTISTS					
	OCCUPATION:	012 AGRICULTURAL SCIENTISTS	(10040050)	COEF= 1.000	INDUSTRIES:	001-184
99.0200	ARCHITECTS					
	OCCUPATION:	084 ARCHITECTS	(10240100)	COEF= 1.000	INDUSTRIES:	001-184

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MAP 48

99.0400	BIOLOGICAL SCIENTISTS				
	OCCUPATION: 014 BIOLOGICAL SCIENTISTS	(10040150)	COEF= 1.000	INDUSTRIES:	001-184
99.0501	LAWYERS				
	OCCUPATION: 092 LAWYERS	(10240500)	COEF= 1.000	INDUSTRIES:	001-184
99.0503	ACTUARIES				
	OCCUPATION: 020 ACTUARIES	(10060050)	COEF= 1.000	INDUSTRIES:	001-184
99.0802	ELEMENTARY SCHOOL TEACHERS				
	OCCUPATION: 067 ELEMENTARY SCHOOL TEACHERS	(10200550)	COEF= 1.000	INDUSTRIES:	001-184
99.0803	SECONDARY SCHOOL TEACHERS				
	OCCUPATION: 069 SECONDARY SCHOOL TEACHERS	(10201150)	COEF= 1.000	INDUSTRIES:	001-184
99.0805	MISC COLL AND UNIV TEACH				
	OCCUPATION: 066 COLLEGE AND UNIVERSITY TEACHERS	(10200100)	COEF= 1.000	INDUSTRIES:	001-184
99.0823	PRESCHOOL,KINDERGARTEN				
	OCCUPATION: 068 PRESCHOOL, KINDERGARTEN	(10201050)	COEF= 1.000	INDUSTRIES:	001-184
99.0827	SCHOOL ADMIN,ELEM,SECONDARY				
	OCCUPATION: 114 SCHOOL ADMIN, ELEM, SECONDARY	(20040400)	COEF= 1.000	INDUSTRIES:	001-184
99.0828	SCHOOL ADMIN,COLLEGE				
	OCCUPATION: 113 SCHOOL ADMIN, COLLEGE	(20040350)	COEF= 1.000	INDUSTRIES:	001-184

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MAP 49

99.0900	ENGINEERS,OTHERS				
	OCCUPATION: 011 ENGINEERS, OTHERS	(10020550)	COEF= 1.000	INDUSTRIES:	001-184
99.0902	ENGINEERS,AERO-ASTRONAUTIC				
	OCCUPATION: 001 ENGINEERS, AERO-ASTRONAUTIC	(10020050)	COEF= 1.000	INDUSTRIES:	001-184
99.0906	ENGINEERS,CHEMICAL				
	OCCUPATION: 002 ENGINEERS, CHEMICAL	(10020100)	COEF= 1.000	INDUSTRIES:	001-184
99.0907	ENGINEERS,PETROLEUM				
	OCCUPATION: 009 ENGINEERS, PETROLEUM	(10020450)	COEF= .800	INDUSTRIES:	001-184
99.0908	ENGINEERS,CIVIL				
	OCCUPATION: 003 ENGINEERS, CIVIL	(10020150)	COEF= .800	INDUSTRIES:	001-184
99.0909	ENGINEERS,ELECTRICAL				
	OCCUPATION: 004 ENGINEERS, ELECTRICAL	(10020200)	COEF= .800	INDUSTRIES:	001-184
99.0910	ENGINEERS,MECHANICAL				
	OCCUPATION: 006 ENGINEERS, MECHANICAL	(10020300)	COEF= .700	INDUSTRIES:	001-184
99.0913	ENGINEERS,INDUSTRIAL				
	OCCUPATION: 005 ENGINEERS, INDUSTRIAL	(10020250)	COEF= 1.000	INDUSTRIES:	001-184
99.0914	ENGINEERS,METALLURGICAL				
	OCCUPATION: 007 ENGINEERS, METALLURGICAL	(10020350)	COEF= 1.000	INDUSTRIES:	001-184

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MAP 50

99.0918	ENGINEERS,MINING				
	OCCUPATION: 008 ENGINEERS, MINING	(10020400)	COEF= 1.000	INDUSTRIES:	001-184
99.1004	MUSICIANS AND COMPOSERS				
	OCCUPATION: 077 MUSICIANS AND COMPOSERS	(10220350)	COEF= 1.000	INDUSTRIES:	001-184
99.1007	ACTORS				
	OCCUPATION: 071 ACTORS	(10220050)	COEF= 1.000	INDUSTRIES:	001-184
99.1008	DANCERS				
	OCCUPATION: 074 DANCERS	(10220200)	COEF= 1.000	INDUSTRIES:	001-184
99.1204	DENTISTS				
	OCCUPATION: 030 DENTISTS	(10100100)	COEF= 1.000	INDUSTRIES:	001-184
99.1206	PHYSICIANS,MD OSTEOPATHS				
	OCCUPATION: 037 PHYSICIANS, MD OSTEOPATHS	(10100300)	COEF= 1.000	INDUSTRIES:	001-184
99.1209	OPTOMETRISTS				
	OCCUPATION: 035 OPTOMETRISTS	(10100200)	COEF= 1.000	INDUSTRIES:	001-184
99.1211	PHARMACISTS				
	OCCUPATION: 036 PHARMACISTS	(10100250)	COEF= 1.000	INDUSTRIES:	001-184
99.1216	PODIATRISTS				
	OCCUPATION: 038 PODIATRISTS	(10100350)	COEF= 1.000	INDUSTRIES:	001-184

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MAP 51

99.1218	VETERINARIANS				
	OCCUPATION:	041 VETERINARIANS	(10100500)	COEF= 1.000	INDUSTRIES: 001-184
99.1221	CHIROPRACTORS				
	OCCUPATION:	032 CHIROPRACTORS	(10100050)	COEF= 1.000	INDUSTRIES: 001-184
99.1507	AUTHORS				
	OCCUPATION:	073 AUTHORS	(10220150)	COEF= 1.000	INDUSTRIES: 001-184
99.1702	STATISTICIANS				
	OCCUPATION:	022 STATISTICIANS	(10060150)	COEF= 1.000	INDUSTRIES: 001-184
99.1901	LIFE,PHYSICAL SCIENTISTS NEC				
	OCCUPATION:	019 LIFE, PHYSICAL SCIENTISTS NEC	(10040400)	COEF= 1.000	INDUSTRIES: 001-184
99.1902	PHYSICISTS AND ASTRONOMERS				
	OCCUPATION:	018 PHYSICISTS AND ASTRONOMERS	(10040350)	COEF= 1.000	INDUSTRIES: 001-184
99.1905	CHEMISTS				
	OCCUPATION:	C15 CHEMISTS	(10040200)	COEF= .800	INDUSTRIES: 001-184
99.1913	ATMOSPHERIC,SPACE SCIENTISTS				
	OCCUPATION:	013 ATMOSPHERIC, SPACE SCIENTISTS	(10040100)	COEF= 1.000	INDUSTRIES: 001-184
99.1914	GEOLOGISTS				
	OCCUPATION:	016 GEOLOGISTS	(10040250)	COEF= 1.000	INDUSTRIES: 001-184

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MAP 52

99.1919	MARINE SCIENTISTS					
	OCCUPATION:	017 MARINE SCIENTISTS	(10040300)	COEF= .600	INDUSTRIES:	001-184
99.2000	PSYCHOLOGISTS					
	OCCUPATION:	061 PSYCHOLOGISTS	(10180150)	COEF= 1.000	INDUSTRIES:	001-184
99.2200	OTHER SOCIAL SCIENTISTS					
	OCCUPATION:	064 OTHER SOCIAL SCIENTISTS	(10180300)	COEF= 1.000	INDUSTRIES:	001-184
99.2204	ECONOMISTS					
	OCCUPATION:	059 ECONOMISTS	(10180050)	COEF= 1.000	INDUSTRIES:	001-184
99.2207	POLITICAL SCIENTISTS					
	OCCUPATION:	060 POLITICAL SCIENTISTS	(10180100)	COEF= 1.000	INDUSTRIES:	001-184
99.2208	SOCIOLOGISTS					
	OCCUPATION:	062 SOCIOLOGISTS	(10180200)	COEF= 1.000	INDUSTRIES:	001-184
04.99.99X	SALESMEN, NEC					
	OCCUPATION:	124 AUCTIONEERS	(30000100)	COEF= 1.000	INDUSTRIES:	001-184
		125 DEMONSTRATORS	(30000150)	1.000		001-051,054-090,093-097,103,105-106,112-119,124,132-144,147
		125 DEMONSTRATORS	(30000150)	1.000		151,153-166,168-177,181-184
07.09.09X	MORTICIANS					
	OCCUPATION:	057 EMBALMERS	(10140150)	COEF= 1.000	INDUSTRIES:	001-184

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TABLE B1

WASHINGTON STATE JOB OPPORTUNITIES FORECAST - THIRD EDITION
CROSSWALK ASSIGNMENT INDEX

14.04.01X TELEPHONE OPERATORS

OCCUPATION: 174 TELEPHONE OPERATORS (40061550) COEF= 1.000 INDUSTRIES: 001-184

14.05.01X EXPEDITERS

OCCUPATION: 155 EXPEDITORS, PROD CONTROLLERS (40060600) COEF= .300 INDUSTRIES: 001-184

16.06.06X MATHEMATICAL TECHNICIANS

OCCUPATION: 029 MECHANICAL ENGINEERING TECH (10080350) COEF= 1.000 INDUSTRIES: 001-184

17.08.01X SAILORS AND DECKHANDS

OCCUPATION: 298 SAILORS AND DECKHANDS (61081200) COEF= .800 INDUSTRIES: 001-184

17.08.98X SHIP OFFICERS

OCCUPATION: 118 OFFICERS, PILOTS, PURSERS, SHIP (20060200) COEF= .700 INDUSTRIES: 001-184

17.10.06X PLASTERERS

OCCUPATION: 187 PLASTERERS AND APPRENTICES (50020700) COEF= .800 INDUSTRIES: 001-184

17.10.07X PLUMBERS

OCCUPATION: 188 PLUMBERS,PIPEFITTERS AND APPRENTICE(50020800) COEF= 1.000 INDUSTRIES: 001-039,041-184

188 PLUMBERS,PIPEFITTERS AND APPRENTICE(50020800) .700 040

17.10.09X GLAZIERS

OCCUPATION: 239 GLAZIERS (50140450) COEF= .800 INDUSTRIES: 001-184

17.10.10X ROOFERS

OCCUPATION: 189 ROOFER AND SLATERS (50020900) COEF= 1.000 INDUSTRIES: 001-184

TABLE B1

WASHINGTON STATE JOB OPPORTUNITIES FORECAST - THIRD EDITION
CROSSWALK ASSIGNMENT INDEX

MAP 54

17.10.87X BOILERMAKERS

OCCUPATION: 194 BOILERMAKERS (50060100) COEF= .700 INDUSTRIES: 001-184

17.10.88X ASBESTOS WORKERS

OCCUPATION: 275 ASBESTOS, INSULATION WORKERS (61080050) COEF= .700 INDUSTRIES: 040

17.10.95X TILE SETTERS

OCCUPATION: 191 TILESETTERS (50021000) COEF= 1.000 INDUSTRIES: 001-184

17.10.96X CARPET INSTALLERS

OCCUPATION: 233 CARPET INSTALLERS (50140150) COEF= 1.000 INDUSTRIES: 001-184

17.14.02X ELECTRIC POWER LINEMEN

OCCUPATION: 225 ELEC POWR LINE INSTALL AND REPAIR (50120050) COEF= .200 INDUSTRIES: 001-184

17.23.01X METAL MOLDERS

OCCUPATION: 200 MOLDERS, METAL AND APPRENTICES (50060450) COEF= 1.000 INDUSTRIES: 001-184

17.23.04X ASSEMBLERS

OCCUPATION: 276 ASSEMBLERS (61080100) COEF= 1.000 INDUSTRIES: 001-184

17.23.07X TOOL AND DIE MAKERS

OCCUPATION: 204 TOOL AND DIEMAKERS AND APPRENTICES (50060750) COEF= .100 INDUSTRIES: 001-184

17.23.97X METAL WORKING TRADES, NEC

OCCUPATION: 195 HEAT TREATERS, ANNEALERS, ETC (50060150) COEF= 1.000 INDUSTRIES: 001-184

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TABLE B1

WASHINGTON STATE JOB OPPORTUNITIES FORECAST - THIRD EDITION
CROSSWALK ASSIGNMENT INDEX

17.23.97X (CONTINUED)

OCCUPATION:	196 FORGE AND HAMMER OPERATORS	(50060200)	COEF= 1.000	INDUSTRIES:	001-184
	256 FURNACE TENDERS, SMELTERS, POURERS	(61020100)	1.000		001-184
	258 HEATERS, METAL	(61020200)	1.000		001-184

17.23.98X SHIPFITTERS

OCCUPATION:	247 SHIPFITTERS	(50140850)	COEF= .400	INDUSTRIES:	001-184

17.23.99X FILERS AND POLISHERS

OCCUPATION:	286 FILER, POLISHER, SANDER, BUFFER	(61080600)	COEF= 1.000	INDUSTRIES:	001-184

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17.29.95X BUTCHERS

OCCUPATION:	289 MEAT CUTTERS, BUTCHERS, EXC MFG	(61080750)	COEF= .500	INDUSTRIES:	001-184
	290 MEAT CUTTERS, BUTCHERS	(61080800)	.400		001-184

17.29.99X BOTTLING AND CANNING OPERATIVES

OCCUPATION:	278 BOTTLING, CANNING OPERATIVES	(61080200)	COEF= 1.000	INDUSTRIES:	001-184

17.32.00X STATIONARY ENGINEERS AND FIREMEN

OCCUPATION:	250 STATIONARY ENGINEERS	(50141000)	COEF= .700	INDUSTRIES:	001-184
	302 FURNACE TENDERS, STOKERS, EXC METAL	(61081400)	1.000		001-184

17.99.99X CHECKERS, MANUFACTURING

OCCUPATION:	270 CHECKERS, EXAMINERS, ETC, MFG	(61060050)	COEF= .200	INDUSTRIES:	001-184

99.99.99 OTHER OCCUPATIONS

OCCUPATION:	036 PHARMACISTS	(10100250)	COEF=-1.000	INDUSTRIES:	001-184

TABLE B1

WASHINGTON STATE JOB OPPORTUNITIES FORECAST - THIRD EDITION
CROSSWALK ASSIGNMENT INDEX

MAP 56

99.99.99 (CONTINUED)

OCCUPATION:	041 VETERINARIANS	(10100500)	COEF=-1.000	INDUSTRIES:	001-184
	092 LAWYERS	(10240500)	-1.000		001-184
	110 INSPECTORS, EXC CONSTRUCT PUB	(20040200)	.200		001-184
	130 STOCK AND BOND SALES AGENTS	(30000400)	.500		001-184
	146 BOOKKEEPERS	(40060150)	.100		001-184
	240 INSPECTORS, LOG AND LUMBER	(50140500)	.500		001-184
	241 INSPECTORS, OTHER	(50140550)	.800		001-184
	271 GRADERS AND SORTERS, MFG	(61060100)	.700		001-184
	349 GUARDS	(70100150)	.200		001-184
	354 COOKS, PRIVATE	(70120100)	.400		001-184

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Note: State Board for Community College Education, with the cooperation of members of the Interagency Forecast Task Force prepared the crosswalk.

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TABLE B2

ECONOMIC CATEGORY NAME LIST

1.01	AGRICU	AGRICULTURAL PRODUCTION
1.02	FOOD	FOOD AND KINDRED
1.03	PAPER	PULP AND PAPER
1.04	APPARL	APPARFL, FABRICATED TEXT.
1.05	PRINT	PRINTING AND PUBLISHING
1.06	CHEM	CHEMICALS
1.07	PETROL	PETROLEUM
1.08	OTR-ND	OTHER NON-DURABLE MANUF.
1.09	LUMBER	LUMBER AND WOOD PRODUCTS
1.10	FURNIT	FURNITURE
1.11	STONE	STONE, CLAY AND GLASS
1.12	FR-FAB	FERROUS AND FABRICATED METALS
1.13	N-FER	NON-FERROUS METALS
1.14	O-MACH	MACHINERY, EXCLUDING ELECT.
1.15	ELECT	ELECTRICAL MACHINERY
1.16	AERO	AEROSPACE EQUIPMENT
1.17	SHIP	SHIPBUILDING
1.18	O-TRAN	OTHER TRANSPORTATION EQUIPMENT
1.19	O-DURA	OTHER DURABLE MANUFACTURING
1.20	MINING	MINING AND QUARRYING
1.21	CONST	CONTRACT CONSTRUCTION
1.22	TRAN	TRANSPORTATION SERVICES
1.23	COM-UT	COMMUNICATION AND UTILITIES
1.24	WHOLES	WHOLESALE TRADE
1.25	RETAIL	RETAIL TRADE
1.26	FIRE	FINANCE, INSURANCE, REAL ESTATE
1.27	SERV	SERVICE AND MISCELLANEOUS
1.28	STLO-A	STATE AND LOCAL ADMINISTRATION
1.29	FEDL-A	FEDERAL GOVERNMENT ADMIN.

TABLE B3

MATRIX-TO-ECONOMIC CATEGORY ASSIGNMENT CODES

ECC		Sequential Code
1.01	AGRICU	001
1.02	FOOD	042-049
1.03	PAPER	054-055
1.04	APPARL	052,053
1.05	PRINT	056-057
1.06	CHEM	058-065
1.07	PETROL	066-067
1.08	OTR-ND	050-051,068-071
1.09	LUMBER	010-012
1.10	FURNIT	013
1.11	STONE	014-018
1.12	FR-FAB	019,022-026
1.13	N-FER	020-021
1.14	O-MACH	027-033
1.15	ELECT	034-036
1.16	AERO	038
1.17	SHIP	039
1.18	O-TRAN	037,040
1.19	O-DURA	041
1.20	MINING	006
1.21	CONST	007-009
1.22	TRAN	072-080
1.23	COM-UT	081-089
1.24	WHOLES	090-104
1.25	RETAIL	105-131
1.26	FIRE	132-136
1.27	SERV	002-005,137-180
1.28	STLO-A	183-184
1.29	FEDL-A	181-182

For definition of sequential codes from the matrix, see Table A1.
For SIC references, see Figure A8.

TABLE B4

WASHINGTON STATE LABOR FORCE SEPARATION RATES

SEQ CODE	MATRIX CODE	OCCUPATION TITLE	1974 RATE	1980 RATE
1	10020050	ENGINEERS, AERO-ASTRONAUTIC	.01102	.01200
2	10020100	ENGINEERS, CHEMICAL	.01340	.01550
3	10020150	ENGINEERS, CIVIL	.01790	.02060
4	10020200	ENGINEERS, ELECTRICAL	.01312	.01500
5	10020250	ENGINEERS, INDUSTRIAL	.01270	.01390
6	10020300	ENGINEERS, MECHANICAL	.01680	.01950
7	10020350	ENGINEERS, METALLURGICAL	.01035	.01110
8	10020400	ENGINEERS, MINING	.01042	.01170
9	10020450	ENGINEERS, PETROLEUM	.01642	.01710
10	10020500	ENGINEERS, SALES	.01672	.01830
11	10020550	ENGINEERS, OTHERS	.01653	.01900
12	10040050	AGRICULTURAL SCIENTISTS	.01890	.02250
13	10040100	ATMOSPHERIC, SPACE SCIENTISTS	.02755	.03370
14	10040150	BIOLOGICAL SCIENTISTS	.02077	.02340
15	10040200	CHEMISTS	.01827	.01940
16	10040250	GEOLOGISTS	.01740	.02100
17	10040300	MARINE SCIENTISTS	.01530	.01650
18	10040350	PHYSICISTS AND ASTRONOMERS	.01372	.01680
19	10040400	LIFE, PHYSICAL SCIENTISTS NEC	.00257	.00250
20	10060050	ACTUARIES	.01177	.01290
21	10060100	MATHEMATICIANS	.00962	.01030
22	10060150	STATISTICIANS	.01600	.01690
23	10080050	AGRI, BIOLOG TECH EXC HEALTH	.02507	.02740
24	10080100	CHEMICAL TECHNICIANS	.01687	.01800
25	10080150	DRAFTERS	.01212	.01340
26	10080200	ELECTRICAL, ELECTRONIC TECH	.01135	.01240
27	10080250	INDUSTRIAL ENGINEERING TECH	.01863	.02090
28	10080300	MATHEMATICAL TECHN	.00392	.00400
29	10080350	MECHANICAL ENGINEERING TECH	.01225	.01300
30	10080400	SURVEYORS	.01797	.02150
31	10080450	ENGINEERING, SCIENCE TECH NEC	.01462	.01620
32	10100050	CHIROPRACTORS	.04807	.06450
33	10100100	DENTISTS	.03622	.04590
34	10100150	DIETITIANS	.03792	.03860
35	10100200	OPTOMETRISTS	.03037	.03660
36	10100250	PHARMACISTS	.03485	.04250
37	10100300	PHYSICIANS, MD OSTEOPATHS	.02987	.03610
38	10100350	PODIATRISTS	.07417	.09090
39	10100400	REGISTERED NURSES	.03763	.03860
40	10100450	THERAPISTS	.02712	.02840
41	10100500	VETERINARIANS	.02545	.03040
42	10100550	OTHER MEDICAL AND HEALTH WORKERS	.01180	.01270
43	10120050	CLINICAL LAB TECHNCL, TECH	.02660	.02810
44	10120100	DENTAL HYGIENISTS	.02717	.02920
45	10120150	HEALTH RECORD TECHNOL, TECH	.03390	.03510
46	10120200	RADIOLOGIC TECHNCL, TECH	.02432	.02650
47	10120250	THERAPY ASSISTANTS	.01515	.01560
48	10120300	OTHER HEALTH TECHNCL, TECH	.02067	.02300
49	10140050	AIRPLANE PILOTS	.01025	.01130
50	10140100	AIR TRAFFIC CONTROLLERS	.01270	.01420

TABLE B4 (CONTINUED)

WASHINGTON STATE LABOR FORCE SEPARATION RATES

SEQ CODE	MATRIX CODE	OCCUPATION TITLE	1974 RATE	1980 RATE
51	10140150	EMBALMERS	.01275	.01320
52	10140200	FLIGHT ENGINEERS	.01052	.01150
53	10140250	RADIO OPERATORS	.02327	.02540
54	10140300	TOOL PROGRAMMERS, NUMERICAL	.00932	.01000
55	10140350	OTHER TECHNICIANS EXC HEALTH	.01450	.01510
56	10160050	COMPUTER PROGRAMMERS	.00815	.00890
57	10160100	COMPUTER SYSTEMS ANALYSTS	.00887	.00940
58	10160150	OTHER COMPUTER SPECIALISTS	.00725	.00770
59	10180050	ECONOMISTS	.01605	.01860
60	10180100	POLITICAL SCIENTISTS	.00000	.00000
61	10180150	PSYCHOLOGISTS	.02572	.02820
62	10180200	SOCIOLOGISTS	.06265	.06280
63	10180250	URBAN AND REGIONAL PLANNERS	.00947	.01030
64	10180300	OTHER SOCIAL SCIENTISTS	.00370	.00370
65	10200050	ADULT EDUCATION TEACHERS	.02640	.02850
66	10200100	COLLEGE AND UNIVERSITY TEACHERS	.01882	.02040
67	10200550	ELEMENTARY SCHOOL TEACHERS	.03482	.03610
68	10201050	PRESCHOOL, KINDERGARTEN	.03077	.03190
69	10201150	SECONDARY SCHOOL TEACHERS	.02135	.02270
70	10201500	TEACHERS NEC, EXC COLL, UNIVER	.04812	.05120
71	10220050	ACTORS	.02065	.02260
72	10220100	ATHLETES AND KINDRED WORKERS	.01555	.01660
73	10220150	AUTHORS	.03197	.03700
74	10220200	DANCERS	.03592	.03960
75	10220250	DESIGNERS	.01907	.02110
76	10220300	EDITORS AND REPORTERS	.02480	.02720
77	10220350	MUSICIANS AND COMPOSERS	.02137	.02250
78	10220400	PAINTERS AND SCULPTORS	.02355	.02730
79	10220450	PHOTOGRAPHERS	.02600	.03020
80	10220500	PUBLIC RELATIONS SPECIALISTS	.02915	.03380
81	10220550	RADIO, TV ANNOUNCERS	.00655	.00670
82	10220600	WRITERS, ARTISTS, ENTERTAIN NEC	.02292	.02660
83	10240050	ACCOUNTANTS	.02855	.03230
84	10240100	ARCHITECTS	.02272	.02670
85	10240150	ARCHIVISTS AND CURATORS	.03690	.04230
86	10240200	CLERGY	.03585	.04440
87	10240250	RELIGIOUS WORKERS, EXC CLERGY	.04940	.05240
88	10240300	FARM MANAGEMENT ADVISORS	.02240	.02420
89	10240350	FORESTERS, CONSERVATIONISTS	.01967	.02230
90	10240400	HOME MANAGEMENT ADVISORS	.02220	.02430
91	10240450	JUDGES	.07835	.09860
92	10240500	LAWYERS	.03030	.03720
93	10240550	LIBRARIANS	.04408	.04550
94	10240600	OPERATIONS, SYSTEMS RESEARCH	.01250	.01400
95	10240650	PERSONNEL LABOR RELATIONS	.02443	.02660
96	10240700	RESEARCH WORKERS, NEC	.01763	.01980
97	10240750	RECREATION WORKERS	.02442	.02810
98	10240800	SOCIAL WORKERS	.02822	.02980
99	10240850	VOCATIONAL, ED COUNSELORS	.02387	.02560
100	20020050	BANK, FINANCIAL MANAGERS	.02377	.02700

TABLE B4 (CONTINUED)

WASHINGTON STATE LABOR FORCE SEPARATION RATES

SEQ CODE	MATRIX CODE	OCCUPATION TITLE	1974 RATE	1980 RATE
101	20020100	CREDIT MANAGERS	.02397	.02570
102	20020150	BUYERS, SHIPPERS, FARM PROD	.04340	.05390
103	20020200	BUYERS, WHOLESALE, RETAIL	.02933	.03330
104	20020250	PURCHASING AGENTS, BUYERS, NEC	.02335	.02650
105	20020300	SALES MANAGER, RETAIL TRADE	.01790	.02000
106	20020350	SALES MANAGER, EXC RET TRADE	.02075	.02390
107	20040050	ASSESS, CONTROL, LOC PUB ADMIN	.05422	.06060
108	20040100	CONSTRUCTION INSPECTOR, PUB	.03865	.04390
109	20040150	HEALTH ADMINISTRATORS	.03595	.03910
110	20040200	INSPECTORS, EXC CONSTRUCT PUB	.03180	.03690
111	20040250	OFFICIALS, ADMINS, PUB	.03268	.03770
112	20040300	POSTMASTERS AND MAIL SUPER	.05150	.05360
113	20040350	SCHOOL ADMIN, COLLEGE	.02272	.02590
114	20040400	SCHOOL ADMIN, ELEM, SECONDARY	.02697	.02960
115	20060050	FUNERAL DIRECTORS	.03655	.04300
116	20060100	MGRS, SUPERINTENDENTS, BLDG	.07312	.08490
117	20060150	OFFICE MANAGERS, NEC	.02848	.03020
118	20060200	OFFICERS, PILOTS, PURSERS, SHIP	.02943	.03430
119	20060250	OFFICIALS OF LODGES, UNIONS	.04045	.04660
120	20060300	RAILROAD CONDUCTORS	.03842	.04570
121	20060350	RESTAURANT, CAFE, BAR MGRS	.03307	.03750
122	20060400	OTHER MGRS, ADMINISTRATORS	.03080	.03620
123	30000050	ADVERTISING AGENTS, SALES WORKERS	.02607	.03020
124	30000100	AUCTIONEERS	.04797	.05660
125	30000150	DEMONSTRATORS	.02900	.03140
126	30000200	HUCKSTERS AND PEDDLERS	.03822	.04070
127	30000250	INSURANCE AGENTS, BROKERS, ETC	.02492	.02950
128	30000300	NEWSPAPER CARRIERS AND VENDORS	.01780	.02080
129	30000350	REAL ESTATE AGENTS, BROKERS	.04470	.05310
130	30000400	STOCK AND BOND SALES AGENTS	.03018	.03730
131	30000450	SALES WORKERS,NEC	.03032	.03370
132	40020050	SECRETARIES, LEGAL	.03095	.03290
133	40020100	SECRETARIES, MEDICAL	.03337	.03480
134	40020150	SECRETARIES, OTHER	.03352	.03540
135	40020200	STENOGRAPHERS	.03580	.03790
136	40020250	TYPISTS	.03182	.03400
137	40040050	BOOKKEEPING, BILLING OPERATORS	.02910	.03090
138	40040100	CALCULATING MACHINE OPERATORS	.03597	.03880
139	40040150	COMPUTER, PERIPHERAL EQUIP	.01337	.01420
140	40040200	DUPLICATING MACHINE OPERATORS	.02720	.02870
141	40040250	KEYPUNCH OPERATORS	.02755	.03010
142	40040300	TABULATING MACHINE OPERATORS	.02240	.02420
143	40040350	OTHER OFFICE MACHINE OPERATORS	.03155	.03290
144	40060050	BANK TELLERS	.02730	.02940
145	40060100	BILLING CLERKS	.02982	.03200
146	40060150	BOOKKEEPERS	.03420	.03600
147	40060200	CASHIERS	.02772	.02960
148	40060250	CLERICAL ASSIST, SOC WELFARE	.02562	.02870
149	40060300	CLERICAL SUPERVISORS, NEC	.02787	.03050
150	40060350	COLLECTORS, BILL AND ACCOUNT	.02795	.03050

TABLE B4 (CONTINUED)

WASHINGTON STATE LABOR FORCE SEPARATION RATES

SEQ CODE	MATRIX CODE	OCCUPATION TITLE	1974 RATE	1980 RATE
151	40060400	COUNTER CLERKS, EXC FOOD	.03522	.03830
152	40060450	DISPATCHER, STARTER, VEHICLE	.02743	.03140
153	40060500	ENUMERATORS AND INTERVIEWERS	.02695	.02860
154	40060550	ESTIMATORS, INVESTIGATORS, NEC	.02743	.03140
155	40060600	EXPEDITORS, PROD CONTROLLERS	.01748	.01890
156	40060650	FILE CLERKS	.03375	.03630
157	40060700	INSURANCE ADJUST, EXAM	.01982	.02200
158	40060750	LIBRARY ATTENDANTS, ASSISTANT	.03890	.04040
159	40060800	MAIL CARRIERS, POST OFFICE	.01855	.02050
160	40060850	MAIL HANDLER, EXC POST OFFICE	.03442	.03930
161	40060900	MESSENGERS AND OFFICE HELPERS	.03042	.03560
162	40060950	METER READERS, UTILITIES	.01667	.01840
163	40061000	PAYROLL, TIME KEEPING CLERKS	.03737	.03970
164	40061050	POSTAL CLERKS	.02687	.02890
165	40061100	PROOFREADERS	.04702	.04920
166	40061150	REAL ESTATE APPRAISERS	.03720	.04560
167	40061200	RECEPTIONISTS	.03332	.03520
168	40061250	SHIPPING, RECEIVING CLERKS	.02190	.02520
169	40061300	STATISTICAL CLERKS	.03230	.03470
170	40061350	STOCK CLERKS, STORE KEEPERS	.02512	.02760
171	40061400	TEACHERS AIDES, EXC MONITORS	.01997	.02140
172	40061450	TELEGRAPH MESSENGERS	.00948	.00970
173	40061500	TELEGRAPH OPERATORS	.03767	.04510
174	40061550	TELEPHONE OPERATORS	.03620	.03800
175	40061600	TICKET STATION, EXPRESS AGENTS	.02582	.02890
176	40061650	WEIGHERS	.01427	.01510
177	40061700	MISC CLERICAL WORKERS, NEC	.03100	.03310
178	50020050	CARPENTERS AND APPRENTICES	.02825	.03380
179	50020150	BRICK AND STONEMASONS AND APPR	.02192	.02530
180	50020250	BULLDOZER OPERATORS	.01910	.02120
181	50020300	CEMENT AND CONCRETE FINISHERS	.02122	.02520
182	50020350	ELECTRICIANS AND APPRENTICES	.01950	.02250
183	50020450	EXCAVATING, GRADING, MACH OP	.02015	.02300
184	50020500	FLOOR LAYERS, EXC TILE SETTERS	.01350	.01530
185	50020550	PAINTERS AND APPRENTICES	.03345	.04080
186	50020650	PAPERHANGERS	.02952	.03890
187	50020700	PLASTERERS AND APPRENTICES	.02825	.03320
188	50020800	PLUMBERS,PIPEFITTERS AND APPRENTICES	.02150	.02510
189	50020900	ROOFER AND SLATERS	.01110	.01290
190	50020950	STRUCTURAL METAL CRAFT	.02062	.02430
191	50021000	TILESETTERS	.01267	.01350
192	50040000	BLUE COLLAR WORKERS SUPVR,NEC	.02263	.02540
193	50060050	BLACKSMITHS	.03900	.04920
194	50060100	BOILERMAKERS	.03630	.04470
195	50060150	HEAT TREATERS, ANNEALERS, ETC	.02223	.02380
196	50060200	FORGE AND HAMMER OPERATORS	.03952	.05280
197	50060250	JOB AND DIE SETTERS, METAL	.01867	.02220
198	50060300	MACHINISTS AND APPRENTICES	.02387	.02770
199	50060400	MILLWRIGHTS	.02900	.03260
200	50060450	MOLDERS, METAL AND APPRENTICES	.01260	.01350

TABLE B4 (CONTINUED)

WASHINGTON STATE LABOR FORCE SEPARATION RATES

SEQ CODE	MATRIX CODE	OCCUPATION TITLE	1974 RATE	1980 RATE
201	50060550	PATTERN AND MODEL MAKERS	.02222	.02620
202	50060600	ROLLERS AND FINISHERS, METAL	.02320	.02530
203	50060650	SHEET METAL WORKERS AND APPRENTICES	.02137	.02520
204	50060750	TOOL AND DIEMAKERS AND APPRENTICES	.02207	.02500
205	50080050	AIR COND, HEATING, REFRIG	.02750	.03320
206	50080100	AIRCRAFT MECHANICS AND REPAIRERS	.01252	.01380
207	50080150	AUTO ACCESSORIES INSTALLERS	.00997	.01080
208	50080200	AUTO BODY REPAIRERS	.01230	.01380
209	50080250	AUTO MECHANICS AND APPRENTICES	.02055	.02400
210	50080350	DATA PROCESSING MACH REPAIRERS	.00605	.00650
211	50080400	FARM IMPLEMENT MECH AND REPAIRERS	.02147	.02530
212	50080450	HEAVY EQUIP MECH, INCL DIESEL	.02310	.02640
213	50080500	HOUSEHOLD APPLIANCE MECHANICS	.02075	.02390
214	50080550	LOOM FIXERS	.02062	.02130
215	50080600	OFFICE MACHINE REPAIRERS	.01735	.02170
216	50080650	RADIO, TELEVISION REPAIRERS	.01965	.02280
217	50050700	RAILROAD, CAR SHOP REPAIRERS	.02907	.03320
218	50080750	OTHER MECHANICS AND APPRENTICES	.02232	.02630
219	50100050	BOOKBINDERS	.03637	.04020
220	50100100	COMPOSITORS AND TYPESETTERS	.03100	.03640
221	50100150	ELECTROTYPERS, STEREOTYPERS	.02492	.03010
222	50100200	ENGRAVERS EXC PHOTOENGRAVERS	.04920	.06090
223	50100250	PHOTOENGRAVERS, LITHOGRAPHERS	.02690	.03170
224	50100300	PRINTING PRESS OPERATORS AND APPR	.01627	.01960
225	50120050	ELEC POWR LINE INSTALL AND REPAIR	.01623	.01780
226	50120100	LOCOMOTIVE ENGINEERS	.03073	.03590
227	50120150	LOCOMOTIVE ENGINEER HELPERS	.01910	.02120
228	50120200	POWER STATION OPERATORS	.02275	.02530
229	50120250	TELEPHONE INSTALLERS, REPAIRERS	.00967	.01050
230	50120300	TELEPHONE LINE INSTALL AND REPAIR	.00732	.00770
231	50140050	BAKERS	.02425	.02650
232	50140100	CABINETMAKERS	.02912	.03430
233	50140150	CARPET INSTALLERS	.01195	.01360
234	50140200	CRANE, DERRICK, HOIST OPERATORS	.01937	.02200
235	50140250	DECORATORS, WINDOW DRESSERS	.03100	.03430
236	50140300	DENTAL LABORATORY TECH	.02463	.02920
237	50140350	FURNITURE AND WOOD FINISH	.03132	.03890
238	50140400	FURRIERS	.08490	.09870
239	50140450	GLAZIERS	.01622	.01930
240	50140500	INSPECTORS, LOG AND LUMBER	.02702	.03040
241	50140550	INSPECTORS, OTHER	.03197	.03850
242	50140600	JEWELERS AND WATCHMAKERS	.04710	.05850
243	50140650	MILLERS, GRAIN, FLOUR, SEED	.02755	.03340
244	50140700	MOTION PICTURE PROJECTIONISTS	.03182	.03820
245	50140750	OPTICIANS, LENS GRINDER, POLISHER	.02057	.02380
246	50140800	PIANO, ORGAN TUNERS, REPAIRERS	.05590	.06940
247	50140850	SHIPFITTERS	.02505	.02910
248	50140900	SHOE REPAIRERS	.07460	.09590
249	50140950	SIGN PAINTERS AND LETTERERS	.04125	.05250
250	50141000	STATIONARY ENGINEERS	.03200	.03710

TABLE B4 (CONTINUED)

WASHINGTON STATE LABOR FORCE SEPARATION RATES

SEQ CODE	MATRIX CODE	OCCUPATION TITLE	1974 RATE	1980 RATE
251	50141050	STONE CUTTERS, STONE CARVERS	.01158	.01330
252	50141100	TAILORS	.06495	.07260
253	50141150	UPHOLSTERERS	.03895	.04720
254	50141200	CRAFT AND KINDRED WORKERS, NEC	.02047	.02400
255	61020050	DRILL PRESS OPERATIVES	.02268	.02500
256	61020100	FURNACE TENDERS, SMELTERS, POURERS	.01545	.01740
257	61020150	GRINDING MACHINE OPERATIVES	.02630	.02960
258	61020200	HEATERS, METAL	.01670	.01940
259	61020250	LATHE, MILLING MACH OPERATIVES	.02187	.02570
260	61020300	METAL PLATERS	.01140	.01260
261	61020350	OTHER PRECISION MACH OPR	.02297	.02710
262	61020400	PUNCH STAMPING PRESS OPR	.01658	.01800
263	61020450	SOLDERERS	.01792	.01890
264	61020500	WELDERS AND FLAME CUTTERS	.02162	.02470
265	61040050	CARDING, LAPPING, COMBING	.00415	.00430
266	61040100	KNITTERS, LOOPERS, AND TOPPERS	.05895	.05880
267	61040150	SPINNERS, TWISTERS, WINDERS	.04865	.05660
268	61040200	WEAVERS	.03950	.04010
269	61040250	OTHER TEXTILE OPERATIVES	.03060	.03150
270	61060050	CHECKERS, EXAMINERS, ETC, MFG	.01887	.02030
271	61060100	GRADERS AND SORTERS, MFG	.03142	.03300
272	61060150	MEAT WRAPPERS, RETAIL TRADE	.02327	.02440
273	61060200	PACKER, WRAPPER, EX MEAT, PRODUCE	.02392	.02550
274	61060250	PROD GRDR, PACKER, EXC FACT, FARM	.04467	.04520
275	61080050	ASBESTOS, INSULATION WORKERS	.01435	.01570
276	61080100	ASSEMBLERS	.01807	.01980
277	61080150	BLASTERS	.03097	.03660
278	61080200	BOTTLING, CANNING OPERATIVES	.02387	.02530
279	61080250	SURVEY HELPERS	.01092	.01130
280	61080300	CLOTHING IRONERS AND PRESSERS	.03987	.04130
281	61080350	CUTTING OPERATIVES, NEC	.02600	.02900
282	61080400	DRESSMAKERS,EXC FACTORY	.06440	.06440
283	61080450	DRILLERS, EARTH	.02307	.02840
284	61080500	DRY WALL INSTALLERS, LATHES	.00887	.00940
285	61080550	DYERS	.03177	.04220
286	61080600	FILER, POLISHER, SANDER, BUFFER	.02322	.02720
287	61080650	GARAGE WORKERS, GAS STAT ATTEN	.00987	.01160
288	61080700	LAUNDRY, DRY CLEAN OP, NEC	.04107	.04400
289	61080750	MEAT CUTTERS, BUTCHERS, EXC MFG	.02660	.03200
290	61080800	MEAT CUTTERS, BUTCHERS	.01855	.01960
291	61080850	MILLINERS	.11280	.10980
292	61080900	MINE OPERATIVES, NEC	.02692	.03180
293	61080950	MIXING OPERATIVES	.02032	.02310
294	61081000	OILERS, GREASERS, EXC AUTO	.02730	.03150
295	61081050	PAINTERS, MFG ARTICLES	.01735	.02020
296	61081100	PHOTOGRAPHIC PROCESS WORKERS	.02785	.02950
297	61081150	RIVETERS AND FASTENERS	.00940	.01000
298	61081200	SAILORS AND DECKHANDS	.02225	.02630
299	61081250	SAWYERS	.02295	.02640
300	61081300	SEWERS AND STITCHERS	.04132	.04260

TABLE B4 (CONTINUED)

WASHINGTON STATE LABOR FORCE SEPARATION RATES

SEQ CODE	MATRIX CODE	OCCUPATION TITLE	1974 RATE	1980 RATE
301	61081350	SHOEMAKING MACHINE OPR	.07565	.07430
302	61081400	FURNACE TENDERS, STOKERS, EXC METAL	.02915	.03320
303	61081450	WINDING OPERATIVES, NEC	.01252	.01350
304	61081500	MISC MACH OPERATIVES	.02185	.02440
305	61081550	OPERATIVES, NEC	.02520	.02790
306	62000050	BOAT OPERATORS	.03485	.04130
307	62000100	BUS DRIVERS	.02390	.02720
308	62000150	CONDUCTORS AND OPERATORS, URBAN RAIL	.03373	.03470
309	62000200	DELIVERY AND ROUTE WORKERS	.01497	.01700
310	62000250	FORK LIFT, TOW MOTOR OPR	.01460	.01640
311	62000300	RAIL VEHICLE OPERATORS,NEC	.03010	.03910
312	62000350	PARKING ATTENDANTS	.04905	.06570
313	62000400	RAILROAD BRAKE OPERATORS, COUPLERS	.02042	.02380
314	62000450	RAILROAD SWITCH OPERATORS	.01422	.01610
315	62000500	TAXICAB DRIVERS, CHAUFFEURS	.02747	.03310
316	62000550	TRUCK DRIVERS	.01555	.01750
317	70020050	LODGING QTRS CLEANERS, EXC PRIV	.04487	.04630
318	70020100	BUILDING INTERIOR CLEANERS, NEC	.04415	.04760
319	70020150	JANITORS AND SEXTONS	.04712	.05680
320	70040050	BARTENDERS	.02825	.03200
321	70040100	WAITERS ASSISTANTS	.00942	.01040
322	70040150	COOKS, EXC PRIVATE	.03650	.03800
323	70040200	DISHWASHERS	.02000	.02180
324	70040250	FOOD COUNTER, FOUNTAIN WORKERS	.02800	.02950
325	70040300	WAITERS	.02880	.03090
326	70040350	FOOD WORKERS, NEC, EXC PRIVATE	.03472	.03630
327	70060050	DENTAL ASSISTANTS	.03112	.03360
328	70060100	HEALTH AIDES, EXCEPT NURSING	.02890	.03040
329	70060150	HEALTH TRAINEES	.03295	.03580
330	70060200	LAY MIDWIVES	.01430	.01550
331	70060250	NURSES AIDES, ORDERLIES	.03618	.03760
332	70060300	PRACTICAL NURSES	.04262	.04360
333	70080050	FLIGHT ATTENDANTS	.03280	.03640
334	70080100	ATTEN, RECREATION, AMUSEMENT	.01747	.02010
335	70080150	ATTEN, PERSONAL SERVICE, NEC	.04537	.05160
336	70080200	BAGGAGE PORTERS AND BELLHOPS	.01442	.01690
337	70080250	BARBERS	.05012	.06280
338	70080300	BOARDING, LODGING HOUSEKEEPERS	.07527	.07610
339	70080350	BOOTBLACKS	.08098	.11150
340	70080400	CHILD CARE WORKERS, EXC PRIVATE	.05035	.05260
341	70080450	ELEVATOR OPERATORS	.04780	.05290
342	70080500	HAIRDRESSERS, COSMETOLOGISTS	.03725	.03920
343	70080550	HOUSEKEEPERS, EXC PRIVATE	.03855	.03990
344	70080650	SCHOOL MONITORS	.02502	.02660
345	70080700	USHERS, RECREATION, AMUSEMENT	.02105	.02300
346	70080750	WELFARE SERVICE AIDES	.04628	.04890
347	70100050	CROSSING GUARD, BRIDGETENDERS	.07037	.08990
348	70100100	FIRE FIGHTERS	.01230	.01350
349	70100150	GUARDS	.05275	.06700
350	70100200	MARSHALS AND CONSTABLES	.00945	.01050

TABLE B4 (CONTINUED)

WASHINGTON STATE LABOR FORCE SEPARATION RATES

SEQ CODE	MATRIX CODE	OCCUPATION TITLE	1974 RATE	1980 RATE
351	70100250	POLICE AND DETECTIVES	.01085	.01220
352	70100300	SHERIFFS AND BAILIFFS	.03130	.03760
353	70120050	CHILD CARE WORKERS	.04720	.04840
354	70120100	COOKS, PRIVATE	.09305	.09350
355	70120150	HOUSEKEEPERS, PRIVATE	.08922	.08840
356	70120200	LAUNDERERS, PRIVATE	.08050	.07930
357	70120250	CLEANERS AND SERVANTS, PRIVATE	.08082	.08030
358	80000050	ANIMAL CARETAKERS, EXC FARM	.02580	.02910
359	80000100	CARPENTERS, HELPERS	.01205	.01460
360	80000150	CONSTR LABR, EXC CARPENTER HELP	.01730	.01970
361	80000200	FISHERS, HUNTERS AND TRAPPERS	.03495	.04140
362	80000250	FREIGHT, MATERIAL HANDLERS	.01760	.01970
363	80000300	GARBAGE COLLECTORS	.01550	.01850
364	80000350	GARDENERS, GROUNDKEEPER, EXC FARM	.04402	.05610
365	80000400	LONGSHORE WORKERS AND STEVEDORES	.02095	.02320
366	80000450	TIMBER CUTTING AND LOGGING WORKERS	.01847	.02170
367	80000500	STOCK HANDLERS	.01132	.01230
368	80000550	TEAMSTERS	.01495	.01780
369	80000600	VEHICLE WASHER, EQUIP CLEANERS	.01280	.01460
370	80000650	WAREHOUSE LABORERS, NEC	.01687	.01890
371	80000700	OTHER LABORERS	.02297	.02650
372	90020050	FARMERS OWNERS AND TENANTS	.05390	.06740
373	90020100	FARM MANAGERS	.03497	.04270
374	90040050	FARM LABOR SUPERVISORS	.03212	.03850
375	90040100	FARM LABORERS, WAGE WORKERS	.03080	.03740
376	90040150	FARM LABORERS, UNPAID FAMILY	.03432	.03980
377	90040200	FARM LABORERS, SELF-EMPL	.07132	.09750

Source: Bureau of Labor Statistics, as revised in June 1977. These rates reflect significant shifts in the participation of women in the labor force.

TABLE B5

SAMPLE OUTPUT TABLE FROM PROGRAM SQUEEZE

WASHINGTON STATE COMMISSION FOR VOCATIONAL EDUCATION
THIRD EDITION - JOB OPPORTUNITIES FORECAST

PREPARED BY HUMAN RESOURCES PLANNING INSTITUTE
SEATTLE, WASHINGTON JUNE 1977
RUN: 06/23/77, DATA: 1974, ASSIGNMENT: 06/23/77

PROGRAM: 16.01.99 MARINE TECHNOLOGY
ALSO SEE 16.06.04 MARINE SCIENCE TECH.

REPLACEMENT RATE= .016753

ECC	EMPLY	SR	ECC	EMPLY	SR	ECC	EMPLY	SR	ECC	EMPLY	SR	ECC	EMPLY	SR	ECC	EMPLY	SR
AGRICU	1	.00001	CHEM	5	.00090	STONE	2	.00040	AERO	61	.00114	CONST	68	.00081	FIRE	0	.00000
FOOD	6	.00020	PETROL	1	.00026	FR-FAB	9	.00073	SHIP	22	.00108	TRAN	211	.00380	SERV	196	.00049
PAPER	41	.00233	OTR-ND	0	.00000	N-FER	11	.00090	O-TRAN	1	.00023	COM-UT	22	.00059	STLO-A	43	.00112
APPARL	1	.00012	LUMBER	13	.00026	O-MACH	3	.00022	O-DURA	2	.00020	WHOLES	18	.00024	FEDL-A	59	.00161
PRINT	1	.00008	FURNIT	0	.00000	ELECT	3	.00048	MINING	0	.00000	RETAIL	16	.00007	TOTAL	816	.00060

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PROGRAM: 16.02.03 FOOD PROCESSING TECHNOLOGY

REPLACEMENT RATE= .033967

ECC	EMPLY	SR	ECC	EMPLY	SR	ECC	EMPLY	SR	ECC	EMPLY	SR	ECC	EMPLY	SR	ECC	EMPLY	SR
AGRICU	6	.00011	CHEM	0	.00005	STONE	0	.00000	AERO	1	.00002	CONST	5	.00006	FIRE	13	.00019
FOOD	152	.00533	PETROL	0	.00000	FR-FAB	0	.00000	SHIP	3	.00014	TRAN	70	.00125	SERV	2478	.00621
PAPER	5	.00029	OTR-ND	0	.00000	N-FER	2	.00013	O-TRAN	0	.00000	COM-UT	9	.00025	STLO-A	34	.00087
APPARL	1	.00014	LUMBER	10	.00019	O-MACH	0	.00000	O-DURA	0	.00000	WHOLES	11	.00014	FEDL-A	40	.00111
PRINT	0	.00003	FURNIT	0	.00000	ELECT	0	.00000	MINING	0	.00014	RETAIL	5340	.02293	TOTAL	8179	.00606

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TABLE B6

SAMPLE OUTPUT TABLE FROM PROGRAM DEMAND

WASHINGTON STATE COMMISSION FOR VOCATIONAL EDUCATION
THIRD EDITION - JOB OPPORTUNITIES FORECAST - JUNE 1977

SECTION: 1 EDUCATIONAL PROGRAMS

FIELD: 17.00.00 TRADE AND INDUSTRIAL OCCUPATIONS

PROGRAM: 17.23.05 SHEETMETAL

FISCAL YEAR	1980	1981	1982	1983	1984	1985
DEMAND	295	283	267	231	195	159
EXPANSION	181	165	146	108	71	34
REPLACEMENT	114	118	121	123	124	125
EMPLOYMENT	5345	5510	5656	5764	5835	5869
REPLACEMENT RATE	.0213	.0213	.0213	.0213	.0213	.0213

PROGRAM: 17.23.06 WELDING

FISCAL YEAR	1980	1981	1982	1983	1984	1985
DEMAND	870	879	871	849	784	737
EXPANSION	562	557	536	501	426	370
REPLACEMENT	308	322	335	348	358	367
EMPLOYMENT	12446	13003	13539	14040	14466	14836
REPLACEMENT RATE	.0248	.0248	.0248	.0248	.0248	.0248

PROGRAM: 17.24.00 MATERIALS TESTING

FISCAL YEAR	1980	1981	1982	1983	1984	1985
DEMAND	76	78	74	73	74	71
EXPANSION	42	42	37	35	35	31
REPLACEMENT	34	36	37	38	39	40
EMPLOYMENT	1115	1157	1194	1229	1264	1295
REPLACEMENT RATE	.0308	.0308	.0308	.0308	.0308	.0308

PREPARED BY HUMAN RESOURCES PLANNING INSTITUTE 06/23/77 TABLE B2

ADAPTING THE ECONOMIC FORECAST

The economic category (ECC) forecast is a seven year projection of employment in selected industry categories. It is this industry forecast, as exogenous input to the system, which is distributed among the occupational categories represented by the educational programs. For each educational program a set of staffing ratios is derived from the industry-occupation employment matrix. It is essential that the classification scheme of the matrix be compatible with the industry groupings of the economic categories.

The economic forecast used as input to the Job Opportunities Forecast was adapted from a forecast prepared by the Washington State Department of Revenue. Recently revised projections of wage and salary employment through 1990 were made available to support the JOF project. However, the DR forecast was not in a form compatible with the industry-occupation matrix. Before it could be used as input to the JOF system, these incompatibilities had to be resolved.

The following procedures were followed in adapting the Department of Revenue economic forecast for use as input in the JOF:

1. Fiscal year forecasts

   The educational instruction year follows more closely to the State's fiscal year than to the calendar year. Therefore, the calendar year forecasts were converted to fiscal years by averaging the employment in a given calendar year with the employment reported in the previous calendar year.

2. Revising wage and salary employment

   Several of the wage and salary categories projected by DR excluded

certain employment counted by BLS on their matrix. First, printing did not count newsboys. Second, services did not count private household employment and finally federal government did not include certain construction workers, most notably, the Corps of Engineers. To remove this incompatibility estimates of the uncounted employment were provided by Employment Security and added to the wage and salary DR projections.

3. Estimating non-wage and salary employment

To fill out the DR wage and salary forecast estimates were made for employment for the categories: agriculture production (private sector), self employment and unpaid family workers. These estimates were computed from linear interpolation of 1974 and 1985 values provided by Employment Security.

4. The expanded DR forecast

The DR forecast (including some historical years) for the period FY 1973 - 1979 and the perioa FY 1979 - 1985, as expanded by items 1 - 3 above, are presented in tables B7 and B8 respectively.

5. Distributing the worker class employment

In the expanded forecast employment, government, self employment and unpaid family workers were presented as separate categories. The matrix, however, counts workers in these categories (usually called worker classes) along with the private sector employment in the 184 industry categories. Thus, to make the expanded forecast compatible with the matrix, the worker class employment must be distributed. To accomplish this, factors were derived from employment reported by worker class in 1974 by Employment Security. The worker class employment is shown in Table B9. The factors, representing proportions of total employment in each worker class appli-

able to each economic category, are shown in Table B10. Lacking similar worker class data in subsequent years, these factors were assumed to remain constant throughout the forecast period to 1985.

6. The distributed DR forecast

The worker class factors, when applied to the respective employment in a given worker class, provided a means to distribute the worker class employment to the other economic categories. All of the self employment and the unpaid family workers were distributed. Most of the government workers were distributed. However, a residual of government workers represented public administration (or federal postal service) employment. The resulting forecast became input to the JOF. The economic forecast input for FY 1973 - 1979 is shown on Table B11 and for FY 1979 - 1985 on Table B12.

A feature of the employment matrix not accounted for in the procedures above, concerns multible job holders. The original DR forecast counted jobs rather than workers, as the matrix does. Since the object of the JOF model is to project job opportunities, it did not seem appropriate to make this adjustment. As a consequence, the economic forecast used as input to the model is greater than the total employment reported in the matrix. For example, in calendar year 1974, the difference represented about 2.7% of the employment reported on the matrix.

TABLE B7

EXPANDED ECONOMIC FORECAST, FISCAL YEARS 1973-1979

		FY73	FY74	FY75	FY76	FY77	FY78	FY79
1.01	Agricu	22,900	23,800	24,400	24,800	25,300	25,700	26,000
1.02	Food	27,900	28,700	29,100	29,900	30,200	29,800	30,100
1.03	Paper	17,700	17,800	17,000	17,100	17,800	18,500	19,000
1.04	Apparel	6,500	6,700	6,600	6,400	6,700	7,000	7,400
1.05	Print	11,700	12,100	12,300	12,300	12,500	12,800	13,000
1.06	Chem	5,600	5,700	6,200	6,100	6,300	6,600	6,700
1.07	Petroleum	1,600	1,800	2,000	2,000	2,000	2,100	2,100
1.08	Otr-Nd	3,000	3,300	3,400	3,500	3,900	4,300	4,600
1.09	Lumber	49,200	49,700	45,700	45,200	47,100	48,200	48,700
1.10	Furniture	3,500	3,900	3,800	3,600	3,600	3,700	3,800
1.11	Stone	5,700	5,800	6,000	6,100	6,300	6,400	6,500
1.12	Fr-Fab	10,700	11,900	13,400	13,400	12,900	13,500	14,800
1.13	N-Fer	11,000	11,600	11,500	11,200	11,400	12,100	13,100
1.14	O-Mach	11,600	12,700	13,200	12,400	12,900	14,400	16,000
1.15	Elect	6,300	6,800	7,100	6,900	7,700	8,500	9,100
1.16	Aero	46,200	52,900	54,300	48,400	47,000	49,900	53,600
1.17	Ship	7,500	8,300	9,200	9,200	9,600	9,800	10,100
1.18	O-Tran	5,800	5,700	5,700	5,100	5,400	6,100	6,600
1.19	O-Dura	4,000	4,600	4,500	5,000	5,400	5,600	5,700
1.20	Mining	1,800	1,900	2,000	2,000	2,100	2,200	2,300
1.21	Const	54,400	55,400	55,300	55,000	57,800	61,200	62,300
1.22	Tran	47,800	49,100	48,300	47,200	48,700	49,600	50,400
1.23	Com-Ut	23,800	24,300	24,900	24,800	25,500	26,300	27,000
1.24	Wholes	66,100	69,500	72,100	72,900	75,100	78,300	80,900
1.25	Retail	189,800	196,800	207,200	213,700	222,200	231,300	242,000
1.26	Fire	62,400	64,500	65,700	67,100	69,200	71,400	72,900
1.27	Serv	209,400	220,800	234,200	241,800	251,700	261,700	270,100
1.28	Stlo-G	203,300	203,800	212,300	212,400	214,700	219,200	223,600
1.29	Fed-G	62,000	64,900	67,300	67,400	67,600	67,900	68,800
1.30	Self	123,900	125,700	127,600	129,400	131,200	133,000	134,800
1.31	Unpd	14,800	14,900	14,900	15,000	15,000	15,000	15,100
1.32	Total Jobs	1,317,900	1,365,400	1,407,200	1,417,300	1,454,800	1,502,100	1,547,100

Source: Washington State Department of Revenue, as expanded by HRPI.
Categories 1.27 thru 1.31 remain to be HRPI distributed, see Table B11.

TABLE B8

EXPANDED ECONOMIC FORECAST, FISCAL YEARS 1979-1985

		FY79	FY80	FY81	FY82	FY83	FY84	FY85
1.01	Agricu	26,000	26,500	26,800	27,200	27,600	28,100	28,400
1.02	Food	30,100	30,400	30,700	30,900	31,200	31,500	31,600
1.03	Paper	19,000	19,300	19,500	19,700	20,000	20,100	19,900
1.04	Apparel	7,400	7,700	7,800	8,100	8,400	8,500	8,600
1.05	Print	13,000	13,300	13,500	13,800	14,000	14,100	14,200
1.06	Chem	6,700	6,800	6,900	7,000	7,100	7,200	7,300
1.07	Petroleum	2,100	2,200	2,200	2,200	2,300	2,300	2,300
1.08	Otr-Nd	4,600	5,000	5,300	5,700	6,200	6,500	6,600
1.09	Lumber	48,700	49,200	49,900	50,400	50,800	50,900	50,700
1.10	Furniture	3,800	3,900	4,000	4,100	4,200	4,300	4,300
1.11	Stone	6,500	6,500	6,600	6,800	6,800	6,800	6,900
1.12	Fr-Fab	14,800	15,300	15,800	16,300	16,700	16,900	17,100
1.13	N-Fer	13,100	13,800	14,500	15,000	15,500	16,000	16,300
1.14	O-Mach	16,000	17,400	18,700	20,000	21,400	22,600	23,600
1.15	Elect	9,100	10,100	11,200	12,200	13,200	14,200	15,100
1.16	Aero	53,600	57,100	59,600	61,700	63,400	64,800	65.400
1.17	Ship	10,100	10,600	11,100	11,500	12,000	12,600	13,200
1.18	O-Tran	6,600	6,800	6,900	7,000	7,200	7,300	7,500
1.19	O-Dura	5,700	5,800	5,900	6,100	6,200	6,400	6,600
1.20	Mining	2,300	2,400	2,500	2,500	2,600	2,600	2,700
1.21	Const	62,300	64,000	66,800	70,000	71,200	70,600	69,300
1.22	Tran	50,400	51,200	51,900	52,400	52,900	53,400	53,600
1.23	Com-Ut	27,000	27,700	28,600	29,200	29,700	30,200	30,800
1.24	Wholes	80,900	83,300	85,600	87,600	89,300	90,700	92,100
1.25	Retail	242,000	253,200	263,700	273,000	281,100	288,200	295,800
1.26	Fire	72,900	74,600	76,400	78,000	79,500	80,900	82,200
1.27	Serv	270,100	278,500	285,500	292,100	298,800	304,400	310,100
1.28	Stlo-G	223,600	227,500	230,400	231,900	233,300	235,800	238,400
1.29	Fed-G	68,800	70,400	72,100	73,200	74,100	75,400	76,300
1.30	Self	134,800	136,600	138,400	140,300	142,100	143,900	145,700
1.31	Unpd	15,100	15,100	15,200	15,200	15,300	15,300	15,400
1.32	Total Jobs	1,547,100	1,592,200	1,634,000	1,671,100	1,704,100	1,732,500	1,758,000

Source: Washington State Department of Revenue, as expanded by HRPI.
Categories 1.27 thru 1.31 remain to be HRPI distributed, see Table B12.

TABLE B9

BREAKOUT OF EMPLOYMENT BY WORKER CLASS

	ECC	TOTAL	PRVT	FEDL	STLO	SELF	UNPD
1.01	AGRICU	49049	21808	152	373	21676	5038
1.02	FOOD	28554	28273	0	0	237	44
1.03	PAPER	17420	17371	0	0	49	0
1.04	APPARL	6927	6774	0	0	136	17
1.05	PRINT	13067	12335	0	0	644	88
1.06	CHEM	5910	5837	0	0	46	27
1.07	PETROL	1904	1874	0	0	7	23
1.08	OTR-ND	3467	3353	0	0	114	0
1.09	LUMBER	50514	47993	0	0	2392	129
1.10	FURNIT	4064	3887	0	0	159	18
1.11	STONE	6010	5760	0	0	250	0
1.12	FR-FAB	12541	12266	0	0	268	7
1.13	N-FER	11877	11818	0	0	37	22
1.14	O-MACH	13473	12863	0	0	552	58
1.15	ELECT	7326	7115	0	0	159	52
1.16	AERO	53598	53459	0	0	121	18
1.17	SHIP	20725	8930	11543	0	200	52
1.18	O-TRAN	5614	5525	0	0	76	13
1.19	O-DURA	7912	4461	2804	0	576	71
1.20	MINING	2212	2023	0	0	167	22
1.21	CONST	63331	53686	1531	14411	12999	704
1.22	TRAN	55597	47048	80	5973	2297	199
1.23	COM-UT	36428	23814	2758	9398	418	40
1.24	WHOLES	76253	70300	0	0	5414	539
1.25	RETAIL	232309	197259	3573	864	26221	4392
1.26	FIRE	69351	61675	795	443	6059	379
1.27	SERV	377939	199905	7317	122426	45368	2923
1.28	STLO-A	37564	0	0	37564	0	0
1.29	FEDL-A	36437	0	36437	0	0	0
1.30	TOTAL	1327373	927412	66990	191452	126644	14875

Source: Washington State Department of Employment Security, from preliminary report for calendar year 1974.

TABLE B10

WORKER CLASS DISTRIBUTION FACTORS

ECC		FEDL	STLO	SELF	UNPD
1.01	AGRICU	.00227	.00195	.17117	.33869
1.02	FOOD	.00000	.00000	.00187	.00296
1.03	PAPER	.00000	.00000	.00039	.00000
1.04	APPARL	.00000	.00000	.00107	.00114
1.05	PRINT	.00000	.00000	.00509	.00592
1.06	CHEM	.00000	.00000	.00036	.00182
1.07	PETROL	.00000	.00000	.00006	.00155
1.08	OTR-ND	.00000	.00000	.00090	.00000
1.09	LUMBER	.00000	.00000	.01889	.00867
1.10	FURNIT	.00000	.00000	.00126	.00121
1.11	STONE	.00000	.00000	.00197	.00000
1.12	FR-FAB	.00000	.00000	.00212	.00047
1.13	N-FER	.00000	.00000	.00029	.00148
1.14	O-MACH	.00000	.00000	.00436	.00390
1.15	ELECT	.00000	.00000	.00126	.00350
1.16	AERO	.00000	.00000	.00096	.00121
1.17	SHIP	.17231	.00000	.00158	.00350
1.18	O-TRAN	.00000	.00000	.00060	.00087
1.19	O-DURA	.04186	.00000	.00455	.00477
1.20	MINING	.00000	.00000	.00132	.00148
1.21	CONST	.02285	.07527	.10264	.04733
1.22	TRAN	.00119	.03120	.01814	.01338
1.23	COM-UT	.04117	.04909	.00330	.00269
1.24	WHOLES	.00000	.00000	.04275	.03624
1.25	RETAIL	.05334	.00451	.20704	.29526
1.26	FIRE	.01187	.00231	.04784	.02548
1.27	SERV	.10923	.63946	.35823	.19650
1.28	STLO-A	.00000	.19621	.00000	.00000
1.29	FEDL-A	.54392	.00000	.00000	.00000

Source: Computed as proportions of total employment in each worker class from TABLE B9.

TABLE B11

WASHINGTON STATE COMMISSION FOR VOCATIONAL EDUCATION
THIRD EDITION - JOB OPPORTUNITIES FORECAST - JUNE 1977

ECONOMIC CATEGORY EMPLOYMENT FORECAST

CODE	NAME	FISCAL YEAR 1973	1974	1975	1976	1977	1978	1979
1.01	AGRICULTURAL PRODUCTION	49700	50900	51900	52600	53400	54100	54800
1.02	FOOD AND KINDRED	28200	29000	29400	30200	30500	30100	30400
1.03	PULP AND PAPER	17700	17800	17000	17200	17500	18600	19100
1.04	APPAREL, FABRICATED TEXT.	6600	6900	6800	6600	6900	7200	7600
1.05	PRINTING AND PUBLISHING	12400	12800	13000	13000	13300	13600	13800
1.06	CHEMICALS	5700	5800	6300	6200	6400	6700	6800
1.07	PETROLEUM	1600	1800	2000	2000	2000	2100	2100
1.08	OTHER NON-DURABLE MANUF.	3100	3400	3500	3600	4000	4400	4700
1.09	LUMBER AND WOOD PRODUCTS	51700	52200	48200	47800	49700	50800	51400
1.10	FURNITURE	3700	4100	4000	3800	3800	3900	4000
1.11	STONE, CLAY AND GLASS	5900	6000	6300	6400	6600	6700	6800
1.12	FERROUS AND FABRICATED METALS	11000	12200	13700	13700	13200	13800	15100
1.13	NON-FERROUS METALS	11100	11700	11600	11300	11500	12200	13200
1.14	MACHINERY, EXCLUDING ELECT.	12200	13300	13800	13000	13500	15000	16600
1.15	ELECTRICAL MACHINERY	6500	7000	7300	7100	7900	8700	9300
1.16	AEROSPACE EQUIPMENT	46300	53000	54400	48500	47100	50000	53700
1.17	SHIPBUILDING	18400	19700	21100	21100	21500	21900	22200
1.18	OTHER TRANSPORTATION EQUIPMENT	5900	5800	5800	5200	5500	6200	6700
1.19	OTHER DURABLE MANUFACTURING	7200	8000	8000	8500	8900	9100	9300
1.20	MINING AND QUARRYING	2000	2100	2200	2200	2300	2400	2500
1.21	CONTRACT CONSTRUCTION	84500	85800	86600	86500	89700	93600	95300
1.22	TRANSPORTATION SERVICES	56700	58000	57500	56500	58100	59100	60100
1.23	COMMUNICATION AND UTILITIES	36800	37400	38600	38500	39300	40300	41300
1.24	WHOLESALE TRADE	71900	75400	78100	79000	81300	84500	87200
1.25	RETAIL TRADE	224000	231600	242600	249500	258400	267900	279000
1.26	FINANCE, INSURANCE, REAL ESTATE	69900	72100	73500	75000	77200	79500	81100
1.27	SERVICE AND MISCELLANEOUS	393500	406200	425900	434300	446300	459900	471900
1.28	STATE AND LOCAL ADMINISTRATION	39900	40000	41700	41700	42100	43000	43900
1.29	FEDERAL GOVERNMENT ADMIN.	33700	35300	36600	36700	36800	36900	37400
	TOTAL	1317800	1365300	1407400	1417700	1455100	1502100	1547300

Source: Washington State Department of Revenue, as distributed by HRPI according to proportions of worker class employment reported by Employment Security. This forecast was used as input to the JOF.

TABLE B12

WASHINGTON STATE COMMISSION FOR VOCATIONAL EDUCATION
THIRD EDITION - JOB OPPORTUNITIES FORECAST - JUNE 1977

ECONOMIC CATEGORY EMPLOYMENT FORECAST

CODE	NAME	FISCAL YEAR 1979	1980	1981	1982	1983	1984	1985
1.01	AGRICULTURAL PRODUCTION	54800	55600	56300	57000	57700	58500	59200
1.02	FOOD AND KINDRED	30400	30700	31000	31200	31500	31800	31900
1.03	PULP AND PAPER	19100	19400	19600	19800	20100	20200	20300
1.04	APPAREL, FABRICATED TEXT.	7600	7900	8000	8300	8600	8700	8800
1.05	PRINTING AND PUBLISHING	13800	14100	14300	14600	14800	14900	15000
1.06	CHEMICALS	6800	6900	7000	7100	7200	7300	7400
1.07	PETROLEUM	2100	2200	2200	2200	2300	2300	2300
1.08	OTHER NON-DURABLE MANUF.	4700	5100	5400	5800	6300	6600	6700
1.09	LUMBER AND WOOD PRODUCTS	51400	51900	52600	53200	53600	53800	53600
1.10	FURNITURE	4000	4100	4200	4300	4400	4500	4500
1.11	STONE, CLAY AND GLASS	6800	6800	6900	7100	7100	7100	7200
1.12	FERROUS AND FABRICATED METALS	15100	15600	16100	16600	17000	17200	17400
1.13	NON-FERROUS METALS	13200	13900	14600	15100	15600	16100	16400
1.14	MACHINERY, EXCLUDING ELECT.	16600	18100	19400	20700	22100	23300	24300
1.15	ELECTRICAL MACHINERY	9300	10300	11400	12400	13400	14400	15300
1.16	AEROSPACE EQUIPMENT	53700	57200	59800	61900	63600	65000	65800
1.17	SHIPBUILDING	22200	23000	23800	24400	25000	25900	26600
1.18	OTHER TRANSPORTATION EQUIPMENT	6700	6900	7000	7100	7300	7400	7600
1.19	OTHER DURABLE MANUFACTURING	9300	9400	9600	9900	10000	10300	10500
1.20	MINING AND QUARRYING	2500	2600	2700	2700	2800	2800	2900
1.21	CONTRACT CONSTRUCTION	95300	97500	100700	104200	105800	105600	104700
1.22	TRANSPORTATION SERVICES	60100	61100	61900	62500	63000	63700	64000
1.23	COMMUNICATION AND UTILITIES	41300	42300	43400	44100	44700	45400	46200
1.24	WHOLESALE TRADE	87200	89700	92100	94100	95900	97400	98900
1.25	RETAIL TRADE	279000	290700	301700	311500	320000	327600	335700
1.26	FINANCE, INSURANCE, REAL ESTATE	81100	82900	84800	86500	88100	89600	91000
1.27	SERVICE AND MISCELLANEOUS	471900	483600	493300	501600	510000	518000	526100
1.28	STATE AND LOCAL ADMINISTRATION	43900	44600	45200	45500	45800	46300	46800
1.29	FEDERAL GOVERNMENT ADMIN.	37400	38300	39200	39800	40300	41000	41500
	TOTAL	1547300	1592400	1634200	1671200	1704000	1732700	1758100

Source: Washington State Department of Revenue, as distributed by HRPI according to proportions of worker class employment reported by Employment Security. This forecast was used as input to the JOF.